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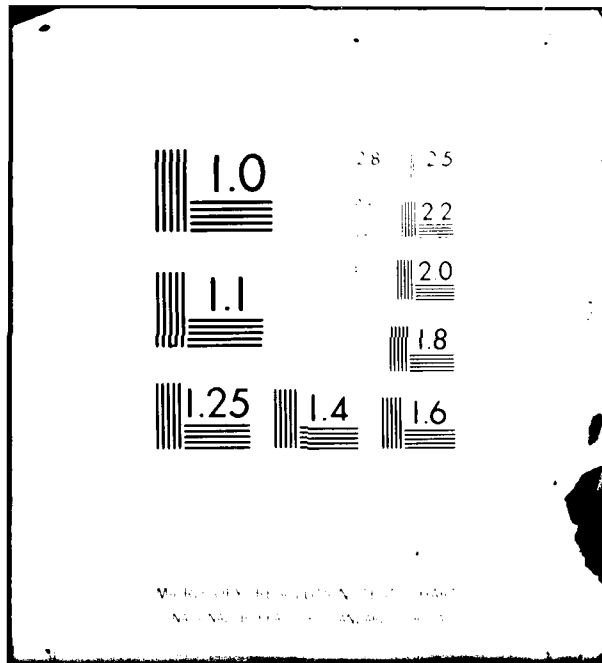
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FINAL ENVIRONMENTAL STATEMENT

MAINTENANCE OPERATIONS OF THE
FEDERAL NAVIGATION CHANNELS AND STRUCTURES AT
BOLLES HARBOR, MICHIGAN

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Prepared by:
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Detroit, Michigan

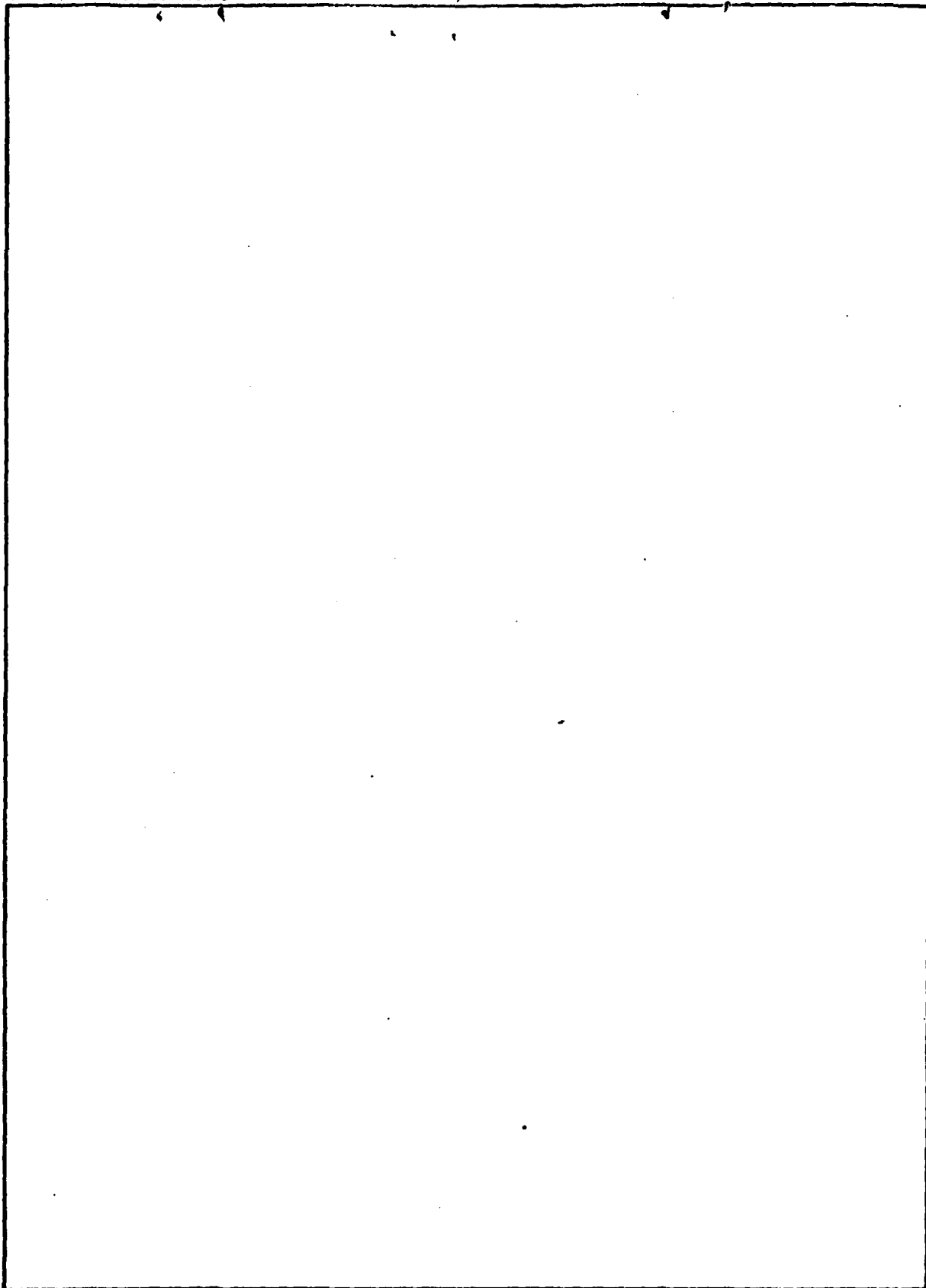
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SUMMARY

MAINTENANCE OPERATIONS OF THE
FEDERAL NAVIGATION CHANNELS AND STRUCTURES AT
BOLLES HARBOR, MICHIGAN

() DRAFT

(X) FINAL ENVIRONMENTAL STATEMENT

Responsible Office: U. S. Army Engineer District, Detroit
Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

Phone (313) 226-6752

1. NAME OF ACTION: (X) ADMINISTRATIVE () LEGISLATIVE

2. DESCRIPTION: The proposed Federal action includes maintenance dredging of the Bolles Harbor navigation channels and maintaining the Federal structures, including revetments. Maintenance dredging would be required approximately every 2 to 3 years to insure continuance of adequate depths for recreational and commercial fishing vessels using the La Plaisance Creek. Maintenance of the structures is required occasionally to maintain the proper stability for protection from wave action or inaccurate navigation. Materials dredged from the uncontaminated portion of the navigation channel would be placed at the 2600' x 2600' open water disposal site located in Lake Erie, approximately 4 1/4 miles SE (150°) from the harbor entrance in La Plaisance Bay. The contaminated sediments would be deposited into the newly constructed confined disposal facility located parallel to the east side of the channel, encompassing an area of approximately 24.6 acres. The annual average volume of shoaling found throughout the entire project is about 19,600 cubic yards of which 8,700 is classified as contaminated and unsuitable for open lake disposal. Dredging operations would require approximately 30 calendar days every 2 years for shoal removal. There is currently a 147,800 cubic yard backlog of which 60,800 cubic yards are unacceptable for open lake disposal. This initial dredging would be accomplished in about 2 to 3 months during June, July, August and September, and thereafter would be limited to the approved June through August period.

Lengthy lists of species, unnecessary figures, detailed technical discussions, and collections of extraneous data not pertinent to project impacts that were included in the draft environmental statement have been eliminated from this final statement. Much of the information has been summarized and emphasis placed on only those aspects having potential for measurable impacts on the environment.

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3. (a) ENVIRONMENTAL IMPACT: Dredging and disposal activities would have temporary adverse effects on water quality, organisms living in and on the bottom sediments in affected areas, aesthetics, recreational fishing, and the ability of the area to support aquatic life. Beneficial impacts of maintenance operations include continuance of the existing local economy through preservation of navigation-dependent commercial enterprises and through recreational benefits available to regional residents and tourists.

(b) ADVERSE ENVIRONMENTAL EFFECTS: Water quality may be temporarily impacted by several of the proposed activities. The impacts would essentially be limited to turbidity and the possible release of nitrogen compounds to the waters during dredging and disposal operations. Recreationalists may be temporarily inconvenienced while the activities are being conducted, but no long-term effects are expected.

4. ALTERNATIVES: In addition to maintenance dredging by bucket or hydraulic pipeline dredge, other alternatives include: (1) discontinue maintenance dredging; (2) dredge the harbor to a lesser depth; (3) alternative dredge types; and (4) dredge only the critically shoaled areas. Implementation of the alternatives could cause economic or social impacts in the Bolles Harbor area. Alternatives to the proposed disposal methods are: (1) confinement of all sediments; (2) open water disposal of all materials; (3) pretreatment of disposal materials; (4) upland disposal; (5) deep water disposal; (6) beach nourishment; and (7) marsh creation. The only true alternative to maintenance of structures related to the navigation project is to terminate maintenance.

5. COMMENTS RECEIVED

Advisory Council on Historic Preservation
Federal Energy Regulatory Commission
U. S. Department of Agriculture-Forest Service
U. S. Department of Agriculture-Soil Conservation Service
U. S. Department of Commerce, NOAA
U. S. Department of the Interior
U. S. Department of Transportation - U. S. Coast Guard
U. S. Environmental Protection Agency
State of Michigan - Department of Natural Resources
Michigan United Conservation Clubs
Southeast Michigan Council of Governments (SEMCOG)

6. DRAFT STATEMENT TO CEQ 27 September 1977

7. FINAL STATEMENT TO EPA _____

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FINAL ENVIRONMENTAL STATEMENT

MAINTENANCE OPERATIONS OF THE FEDERAL NAVIGATION CHANNELS AND STRUCTURES AT BOLLES HARBOR, MICHIGAN

1. PROJECT DESCRIPTION

1.01 The U. S. Army Corps of Engineers is authorized by Congress to perform maintenance dredging of the navigable waterways of the Great Lakes. These waterways provide vital transportation routes for bulk materials, economic stimulus, and increased opportunities for recreational utilization of water resources. It is a Corps' policy (ER 1130-2-307) with respect to authorized navigation projects, to have full project dimensions maintained where feasible and justified. Generally, each waterway and harbor project is adequately maintained consistent with the reasonable needs of existing commerce and traffic, as long as the project remains economically justified.

1.02 Proposed Action. The proposed Federal action includes maintenance dredging of the Federal navigation channels to remove shoaled materials with disposal of the uncontaminated sediments into the open water in Lake Erie and the contaminated sediments into the confined disposal facility, repair of the steel sheet pile revetments, steel sheet pile and rubblemound jetties, and maintaining the disposal facility.

1.03 Project Features and Authorization. The existing Federal navigation project was authorized by the Chief of Engineers July 6, 1965, pursuant to Section 107, River and Harbor Act of 1960 to provide a shallow draft boating channel from deep water in La Plaisance Bay of Lake Erie to the La Plaisance Road Bridge approximately 0.8 miles upstream from the mouth of the La Plaisance Creek (page 55).

1.04 This project was completed in 1969 by the U. S. Army Corps of Engineers and included: an entrance channel 6,300 feet long in Lake Erie, 8 feet deep and 80 feet wide, from deep water to the mouth of La Plaisance Creek where it widened to 100 feet; an access channel in La Plaisance Creek 6 feet deep and 100 feet wide at the mouth widening to 120 feet and extending to the first bend, then narrowing to 30 feet wide and continuing at that width to the La Plaisance Road Bridge for a distance of about 4,500 feet; a 165 foot long steel sheet revetment located on the west side of the channel adjacent to Michigan State Waterways Commission property. As a result of the initial project dredging, a berm about 1,800 feet long and 75 feet wide was created on the northeastern side of the channel.

1.05 The project also provided for inclusion of a 400-foot long steel pile jetty constructed by the Michigan State Waterways Commission at the mouth of La Plaisance Creek. This is now considered a revetment since it is in close proximity to the disposal facility and no longer serves as a structure to protect the harbor. Section 123 of the River and Harbor Act of 1970 authorized construction of a 24.6 acre con-

lined disposal facility, located parallel to the east side of the channel, and a 400-foot rubblemound jetty, located parallel to the western channel line, extending from the harbor mouth lakeward.

1.06 Maintenance dredging projects are reviewed and evaluated under the following laws: Fish and Wildlife Act of 1956; Fish and Wildlife Coordination Act of 1958; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Federal Water Pollution Control Act of 1972; Marine Protection, Research, and Sanctuaries Act of 1972 (if applicable); Endangered Species Act of 1973; Water Resources Development Act of 1976; as well as the Congressional actions authorizing construction and maintenance of the Federal navigation channels.

1.07 Description of Dredged Materials. The material to be removed is expected to be similar in composition to that encountered in the previous dredging. Material in the river is described as silt, and the outer channel is sand and silt. It is believed the river channel material originates primarily from land erosion of the watershed, and the outer channel shoaling results from longshore currents and shoreline erosion in Lake Erie.

1.08 Currently, there is an estimated 147,800 cubic yards of accumulated sediments that requires removal, 60,800 cubic yards of which is unacceptable for open water disposal. The remaining 87,000 cubic yards of sediment is acceptable for open lake disposal. The annual shoaling rate is estimated at 8,700 cubic yards of contaminated material and 10,900 cubic yards of unpolluted material. These quantities reflect a change from the draft environmental statement. See paragraphs 1.09 and 1.10 for explanation.

1.09 In 1972, the U. S. Environmental Protection Agency (EPA) classified the sediments 1500' lakeward to the mouth of La Plaisance Creek as contaminated and from 1500' to 3000' offshore as uncontaminated. This classification was verified in 1975 with the additional comment from EPA that the contaminated material was unacceptable for open lake disposal. Sediment samples were collected and analyzed in December 1976 by the Corps of Engineers. Data from this survey were reviewed by EPA, and the Federal project from the upstream limit to the mouth of La Plaisance Creek has been classified as moderately to heavily contaminated and unsuitable for open lake disposal. The project sediments lakeward of the mouth is classified as uncontaminated and suitable for open lake disposal.

1.10 The diked disposal site was designed to contain the contaminated materials and was addressed in a final environmental statement, "Confined Disposal Facility for Bolles Harbor, Michigan" in October 1974. As explained in paragraph 1.09, the sediments lakeward of the mouth of the creek have been reclassified. Therefore, the quantity of contaminated materials to be placed into the diked disposal facility has been substantially reduced. This could result in the disposal facility having a useful life exceeding the 10 year design. The increase in useful life is not yet defined because of potential increases of permit dredged material coming from a proposed large

marina development. The marina is being planned by the Michigan Department of Natural Resources (MDNR) as a public use facility.

1.11 Dredging Equipment. Large, deep-draft commercial harbors that are maintained by the Detroit District, such as the Rouge River and Detroit River, are dredged by the Corps using a hopper dredge. However, at smaller, shallow-draft recreational harbors, such as Bolles Harbor, the existing range of authorized channel depths (between 6.0 and 8.0 feet at Bolles Harbor) precludes the use of the hopper dredge (which has a loaded draft of 13 feet).

1.12 Maintenance dredging operations at Bolles Harbor would be generally accomplished by bucket or pipeline dredge. The hydraulic pipeline dredge would only be used for dredging of materials to be placed into the confined facility. Prior to dredging, a survey would be conducted to determine the amount and type of sediment to be removed. Then, a dredge would be selected to perform the needed dredging operations. Soundings taken in 1977 indicate that approximately 147,800 cubic yards of sediments have accumulated in the channels.

1.13 A bucket dredge is a mechanical type of dredge that requires auxillary equipment, such as scows and tugs, to receive the dredged material and transport it to the disposal site. Bucket dredges include the backhoe, dipper, dragline, ladder, and grab, the latter in two kinds: clamshell and orange peel buckets. The dredging equipment is located in the stern of a barge which is equipped with two pin-up spuds mounted in the forward part of the hull to lift the vessel above its normal flotation point and to absorb reactions caused by the digging. A walking spud, set in the stern, is equipped with a hydraulic ram that makes the spud move the dredge ahead.

1.14 The pipeline-cutterhead dredge is used for excavating and moving material hydraulically to another location. The dredge is equipped with a powered cutterhead at the suction line to break up dense material and create a slurry that can be more readily transported. The cutterhead and suction pipe are mounted on a ladder frame that is pivoted about the front of the dredge for vertical movement. Two spuds, provided at the stern of the dredge, and swinging cables are used to pivot the vessel around. By alternating the raising of the spuds, the dredge excavates transversely across an area to be deepened.

1.15 Dredging Operations. Channel maintenance consists of a series of specific operations that are conducted in order to identify and remove materials that have entered the project channels. A sounding survey is periodically conducted to determine the location and amount of channel shoaling, and, depending on weather conditions, the survey generally takes about one week to complete. Shoaling information is gathered by sounding equipment on a survey launch

boat, and the recorded information is used to prepare harbor maps that display channel depths in the project area. Harbor maps showing the results of past sounding operations at Bolles Harbor are available for review at the Detroit District Office. Sounding operations in Bolles Harbor channels are performed by the Detroit District using Corps equipment.

1.16 After the navigation channels have been surveyed, dredging activities are conducted to remove channel shoals that have decreased channel depths to levels that are less than the project authorized depths. The proposed operations would be scheduled to prevent interference with any fish spawning and migration activities. After dredging operations have been completed, the channels are resounded to verify channel conditions.

1.17 The current 147,800 cubic yard backlog of sediment would require about 2-3 (June, July, August) months to remove. After the accumulated sediment has been removed, dredging would occur on an "as needed" basis when channel soundings indicate shoaling that could interfere with the safe harbor navigation or when sufficient shoaled materials exist to economically justify movement of a dredge to Bolles Harbor. This would normally occur every second, third, or fourth year and would require approximately 30 days for the dredging activities. Coordination with Michigan DNR allows for dredging to extend through September for the initial dredging only.

1.18 Disposal Operations. During the initial project construction, dredging was done with a pipeline-type dredge, and material was deposited along the north shore of La Plaisance Creek and the northeastern side of the channel 1,800 feet into Lake Erie. This earthen breakwater was protected on the northwest side by 400 feet of steel sheet piling, and on the southeast and southwest sides by riprap.

1.19 In 1970, the open-water disposal practice for contaminated sediments from the upstream portions of the project was discontinued to comply with the Governor of Michigan's request that such dredged material not be placed in open water. Dredging has not been accomplished since 1969 in the Bolles Harbor Federal navigation channels, but is scheduled for 1978.

1.20 The sediments classified as contaminated and unsuitable for open water disposal will be placed into the confined disposal facility. The environmental effects associated with this activity were addressed in the Final Environmental Statement on the "Confined Disposal Facility for Bolles Harbor, Michigan", October 1974.

1.21 Sediments dredged from the mouth of La Plaisance Creek to the outer project limits have been classified as uncontaminated and would be deposited to the open water disposal site. The open water

disposal site is 2,600 feet by 2,600 feet (page 56) and is located approximately 4 1/4 miles southeast of the harbor entrance in La Plaisance Bay.

1.22 Structure Maintenance. The repairs to the structures at Bolles Harbor would be under the "in-kind, in-place" maintenance policy. Maintenance operations would be primarily the replacement of riprap stone on the eastern revetment, repair or replacement of any steel sheet pilings of the western revetment, and replacement of the rubblemound stone from the western jetty.

1.23 Economics. A benefit-cost ratio for operation and maintenance is not included as part of this statement. The District Engineer is directed to provide maintenance of established projects as required. It is the responsibility of the District Engineer to be aware of the utilization at each project and to furnish a justification based on use with his request for maintenance funds for each project. Section 6 of the Water Resources Development Act of 1976 (P.L. 93-251) provides that the costs of operation and maintenance of the general navigation features of small boat harbor projects shall be borne by the United States. This policy applies to both recreational and commercial small boat harbor and channel navigation projects. As indicated in paragraph 2.09 on Recreation, the extensive use of the harbor facilities necessitates maintenance of this project.

1.24 The existing project was completed in 1969. The EPA had, at that time, classified the sediments in the entire project area as contaminated and the Corps agreed to comply with expressed wishes of the Governor to eliminate the disposal of such materials into the open lake waters of Michigan. No maintenance dredging has occurred since that time, as a confined disposal facility has not been available.

1.25 Total Federal costs of the navigation channel at Bolles Harbor as of 30 September 1977 are as follows:

	<u>Existing Project</u>	<u>Previous Project</u>
New Work	\$ 217,916*	0
Maintenance	817,059	0
Total	\$1,034,975	0

*\$255,000 contributed funds not included

2. ENVIRONMENTAL SETTING OF THE PROJECT AREA

2.01 Area Description. Bolles Harbor, at the western end of Lake Erie, is located within the mouth of La Plaisance Creek. The harbor is 37 miles south of Detroit, Michigan, and 14 miles north of Toledo Ohio. Bolles Harbor lies between two authorized Federal projects: Monroe Harbor, a commercial navigation project about 2 1/2 miles to the northeast, and the Toledo Harbor, Ohio, another commercial navigation project about 14 miles to the southwest. The shoreline varies, but is basically wetlands interspersed with artificial shore types in and near the more developed areas. The residential community at Bolles Harbor includes approximately 130 single family houses and summer cottages. These dwellings are predominantly located south of the Creek. Water service is provided by the City of Monroe, and the water intake is located approximately 6 miles north of the channel. Domestic sewage is treated with individual septic tanks, although the community will join the City of Monroe's waste water treatment facilities at some future date.

2.02 Bolles Harbor is primarily a recreational harbor, although many craft use it as a harbor of refuge. Fishing in the harbor is also popular. A very minor commercial fishery operates from the Monroe area, and commercial fishing vessels occasionally dock in the harbor area.

2.03 Topography and Geology. The La Plaisance Creek drainage basin covers only a few square miles. Bolles Harbor is situated on glacial deposits as a result of Pleistocene glaciation. These deposits average about 30 feet in thickness and cover Silurian Age limestone and dolomites. They range from clay-rich glacial till to coarser rock material overlain by early lake deposits and recent sediments of Lake Erie.

2.04 The harbor is located in the western Lake Erie Basin area which is heavily farmed and urbanized. Where cover is found, it is brushy, consisting of idle farmland, small woodlots, and wooded stream bottoms. The vegetation around the harbor is short grass, miscellaneous shrubs, cattails, arrowhead, pondweed, and various rushes and sedges. A few cottonwood, aspen, and willow trees have survived the recent floods caused by record high lake levels.

2.05 Lake Levels. Lake Erie is a shallow body of water and, due to its long axis, is affected by strong winds and gales resulting in the water level fluctuations in Bolles Harbor. The wind can cause the water to be high at one end of the lake, low at the other. Winds recorded at Toledo Harbor, just 14 miles south of Bolles Harbor, show that, from May to November, a southwest wind is prevalent. In the spring months, the winds occur from the southwest and southeast at about equal percentages. Winds in the fall are predominantly from the southeast, with a small percentage from easterly directions.

2.06 Lake level fluctuations occur both annually and over a period of years. During 1974, the difference between the highest (573.30) and lowest (571.49) monthly mean stage was 1.81 feet. Low water datum for Lake Erie is 568.8 feet above mean water level at Father Point, Quebec, Canada (IGLD 1955).

2.07 In addition to the annual fluctuations, oscillations (seiches) produced by a combination of wind and barometric pressure changes accompanying squalls, result in changes in lake levels that last for period of a few minutes to a few hours. Strong winds of sustained speed, duration and direction drive the surface water forward and raise the level on the lee shore and lower it on the weather shore. Because Lake Erie is so shallow, insufficient depth is available to allow reverse currents to return the upper water to the initial locations, causing water to pile up and increase the depth at one end. Highest sustained water levels recorded just north of the river mouth at the Fermi power plant was 575.72 in April 1974.

2.08 Population. Approximately 130 residences comprise Bolles Harbor. The populations of the areas located near the project increased slightly from 1960 to 1970. La Salle Township experienced a 13% population increase to 4,151 in 1970 over 1960, and South Monroe (an unincorporated population center) increased 3.2% to 3,012 during the same period. (1)

2.09 Recreation. Boater use in the harbor area is extensive and varied. The 5 marinas of the waterway provide berthing areas for sailboats, yachts, and other water craft. The Michigan Department of Natural Resources' public launching facility is heavily utilized by boater recreationalists. Facility spot checks during the 1977 season revealed usage of the area for ice fishing, bank fishing, observation, lake fishing, cooking out, picnicking and duck hunting. During calendar year 1977, 81 spot observations were made and 652 and 887 vehicles with boats and without boats, respectively, were observed. Usage on a whole day basis is at least 2.5 times the observed spot usage. (15) Of the 471,406 boats registered in the State of Michigan for 1977, 5,616 boats or 1.19% were registered in Monroe County which was nineteenth in the State.

2.10 The harbor provides supporting businesses for water recreationalists. Yacht clubs and marinas cater to needs of boaters. In addition, a very minor commercial fishery operates out of Bolles Harbor with the bulk of the catch comprised of yellow perch and carp.

2.11 Air Quality. In order to evaluate the ambient air quality conditions and locate the sources of significant air pollution, the Air Quality Division of the Michigan Department of Natural Resources placed monitors within the county to check for significant air pollution sources. Major monitoring emphasis has been placed upon suspended particulates and sulfur dioxide, as well as nitrogen dioxide and carbon monoxide. The 1976 air quality of Monroe County violated

Federally approved State standards for suspended particulates. Primary standards for suspended particulates (260 micrograms/cubic meter, maximum 24 hour concentration) were violated twice at two sites in 1976. A localized problem caused by traffic on unpaved roads is believed to be the explanation for the rise in the annual geometric mean at the downtown industrialized Monroe site. The high levels at the farm field monitoring site resulted from wind blown dusts from open farmlands. Thirty-two violations of secondary standards (150 micrograms/cubic meter, maximum 24 hour concentration) occurred in Monroe County. Discharges of sulfur dioxide did not exceed the primary standard (365 micrograms/cubic meter, maximum 24 hour concentration). (2)

2.12 No violations of the nitrogen dioxide standard (average of 100 micrograms/cubic meter) were reported in 1976 for Monroe County. Monitoring for carbon monoxide, ozone, and hydrocarbons is not conducted in Monroe County.

2.13 Water Quality. In the early 1960's, the waters of La Plaisance Creek were determined by the Michigan Department of Health to be unsuitable for total body contact. High coliform counts, most probably from septic tanks, were responsible for the classification of the harbor waters in 1965. A sewer tie-in with the Monroe Wastewater Treatment Plant is proposed for the Bolles Harbor community and should be constructed at a future date, reducing the high counts found in the river.

2.14 Water quality samples obtained in September 1976 indicated a continuing water quality improvement in the project area. Total coliform counts in the navigation channel ranged from a low of 200 organisms per 100 milliliters (ml) to 436 per 100 ml. The remaining parameters are not considered excessive for warm-water rivers or streams.

2.15 Pollutants. For a better understanding of this report, the use of the word "pollutants" should be defined. Nitrogen and phosphorous compounds, carbons, and metals are nutrients absolutely essential to life. It is only when concentrations of these materials become excessive that there exists a potential for harm to organisms. Chemical oxygen demand is not a material, but is a measure of the potential of sediment or water to consume available oxygen in chemical reduction reactions. Cyanide, phenols, PCB, PBB, PCP, pesticides, and herbicides are true pollutants, being man-made and not occurring naturally under normal circumstances. Pollutants found in Bolles Harbor in excessive concentrations include only nutrients and some oil and grease.

2.16 Sediments. The bottom sediments were sampled and analyzed in 1969 by the Federal Water Pollution Control Administration (FWPCA) (and subsequently in 1972 by the U.S. EPA) to determine the chemical

quality. Based on studies in August 1977, EPA classified the sediments from the mouth to the upstream project limits as contaminated and unsuitable for open lake disposal. Data indicated the sediments were high in chemical oxygen demand, volatile solids and oil and grease. Sediments lakeward of the mouth were classified as uncontaminated and suitable for open lake disposal.

2.17 A survey was conducted in September 1976 by the Corps to update existing data. Results were sent to the EPA for its review and comment. Based upon the data, EPA classified the Federal project from the upstream limit to the mouth of the creek as moderately to heavily polluted and unsuitable for open lake disposal. The Federal project lakeward from the mouth was classified as uncontaminated and suitable for open lake disposal.

2.18 Primary Producers. Primary producers (plants, including algae) are dependent upon a number of conditions, including nutrients, substrate, turbidity and weather. The western basin of Lake Erie is relatively shallow and has a high flushing rate. Nutrients are constantly being introduced by industries, land runoff, and municipalities, particularly, Detroit. Levels of nutrients are sufficient to cause nuisance algal blooms.

2.19 The types of primary producers in the harbor area are apparently limited by the turbidity which restricts light penetration and by the amount of available substrate on which to develop.

2.20 The greater portion of the navigation channel and surrounding bottom area is soft and unstable. Shifting, unstable bottom sediments, moved by wave and current action, generally limit the propagation of attached algal and macrophyte forms (larger aquatic rooted plants). This limitation excludes a major nuisance filamentous algae, Cladophora. An algal dominated community consisting mainly of unattached forms would result.

2.21 Over 200 species of algae have been identified in the area. The population is dominated by 12 species. Composition consists primarily of green algae and diatoms in the spring with a dramatic increase in blue green algae in the summer. By mid-fall, the phytoplankton population is again dominated by green algae and diatoms with winter species comprised almost exclusively of diatoms. (3)

2.22 Benthos. The benthic community is comprised of all organisms that burrow through the mud, attach themselves to solid surfaces, or crawl on the bottom. The density and species depend upon the bottom type (sand, gravel, silt), source of organic food, water depth, and degree of organic enrichment.

2.23 Based on their sensitivity to various environmental conditions, benthic organisms may be classified into three groups: tolerant, intolerant, and facultative. The tolerant organisms

are those that can survive and thrive in enriched or polluted environments, whereas the intolerant organisms are environmentally sensitive and normally not found in polluted conditions. Facultative organisms survive in a wide variety of conditions. Analysis of benthic macroinvertebrates (sludgeworms, midges, etc.) has proven to be a valuable tool in evaluating the prevailing water quality.

(4)
2.24 Carr and Hiltunen described benthic changes that occurred in western Lake Erie from 1930 to 1961. During this period, they reported a sharp decrease in clean water invertebrates (mayflies and caddis flies) and a great increase in sludgeworms (*Oligochaeta*) and midges (*Diptera*).

2.25 Samples collected from the creek, in the channel, and from the proposed disposal area were analyzed by the U.S. EPA in 1969 and revealed a predominance of pollution tolerant benthic forms. Sludgeworms were dominant in the upstream project reaches while the outer channel and areas adjacent to the river mouth were colonized by midges, sludgeworms, and other organisms.

(5)
2.26 Garton described a procedure using the number of sludgeworms to total numbers of individuals ($O/I=N$) per sample to obtain a water quality index from 0 to 1. High ratios indicate a disturbed aquatic system. The presence of sludgeworms does not necessarily indicate pollution (certain species of sludgeworms are intolerant to water quality degradation). However, the absence of intolerant macroinvertebrates does indicate an environmental problem. When applying this water quality index procedure to samples collected from the navigation channel in September 1976, a mean numerical index of .96 or greater results, indicating a disturbed aquatic system.

2.27 The open lake stations had lower indices indicating the presence of other taxa and lower total colonization. No stations in the area were indicative of pristine conditions. Open lake waters are generally less productive due to shifting sediment along with a decrease in organic matter and the resultant decrease in bacteria which are used as a food source by sludgeworms and certain midges. The highest production (number per square meter) of invertebrates in the area was recorded in La Plaisance Creek where the water is shallow, nutrients are present, and the sediments are soft and protected.

2.28 In organically enriched areas, concentrations of sludgeworms as high as 400,000 per square meter ($\#/m^2$) have been reported.⁽⁶⁾ Maximum values from the Federal navigation channel were under 7000/ m^2 . Although these values are not excessive, the almost total absence of other organisms indicates an unbalanced aquatic system. Many factors may be influencing water quality in the river including point source discharges, municipal wastes, land runoff, and sediment composition.

2.29 The benthic macroinvertebrates of the bay area are mainly burrowing organisms (worms, clams, midges). Lee & Plumb (6) postulated that burrowing organisms (sludgeworms and midges) would be favored during periods of increased sedimentation. Preliminary data from a study on "Determination of Vertical Migration of Benthos in Dredged Material Deposits" for the Corps Waterways Experiment Station indicate that juvenile hard clams and polychaete worms can migrate through at least 32 cm of sediments without apparent harm. Similar work is being conducted using certain fresh water invertebrates from the midge, mollusk, sludgeworm and mayfly groups. The final report is scheduled for distribution in 1978. Data indicate all freshwater individuals tested could migrate through 32 cm of sediments without apparent harm except the mayfly (11 cm).

2.30 Waterfowl. Western Lake Erie is an important link in the migration corridor from Ontario and Western Quebec to the Gulf Coast area. The western basin is also an important stopover point for birds nesting in the northwest territories and in the prairies of Canada that winter along the Atlantic Coast. The project area is located at the northern edge of the waterfowl wintering grounds. Migrating waterfowl utilize the nearshore lake area intensively in the fall from September until freeze-up in mid-December, and in the spring from early March to early May. It has been estimated that a total of over one million diving ducks (scaup, goldeneye, ruddy) and perhaps a half-million dabbling ducks (black, mallard, widgeon) pass through during spring and fall migration.(7) The common merganser and the lesser scaup comprised the bulk of the ducks in the immediate area during fall and spring migrations respectively in 1969 and 1970.

2.31 During the fall, six duck species have been identified as dominant: black (Anas rubripes), lesser scaup (Aythya affinis), mallard (Anas platyrhynchos), common merganser (Mergus merganser), ruddy duck (Oxyura jamaicensis), and goldeneye (Bucephala clangula). Moderate numbers of widgeon (Mareca americana) were found in the spring migration.

2.32 The areas of marshland available for nesting are located south of the Bolles Harbor at the Erie State Game Area (1,800 acres) and the Pointe Mouillee State Game Area (2,900 acres). Wildlife refuges are located at the Wyandotte National Wildlife Refuge (305 acres) in the lower Detroit River, Point Pelee National Park in Ontario (2,500 acres), and Holiday Beach Provincial Park, also in Ontario (250 acres). Additionally, there are numerous privately-owned hunting preserves located along this shoreline. The Michigan Department of Natural Resources reported 26,521 ducks were bagged in Monroe County during 1975 by 4,207 hunters, over a 6-year period, 1970 through 1975, an average of 3,552 hunters shot an average 21,490 ducks per year.

2.33 Waterfowl food studies conducted by the Michigan DNR at Houghton Lake⁽⁸⁾ indicate animal matter as the predominant spring food (90%) for both the lesser scaup and goldeneyes. Availability of food sources tends to influence the distribution of some species in the area. Knowledge of the food requirements of the various species and the availability of the few macrophytes and limited invertebrates in the area indicates that the Monroe area lacks sufficient food supply, unless fish is consumed to supplement the diets. The limited aquatic macrophyte production in the area probably restricts the use of the Monroe area by vegetation feeding waterfowl. Mergansers, being fish consumers, are not directly affected by the invertebrate populations.

2.34 Waterfowl are not the only water-oriented birds found in such abundance in the region. Many species of marsh and shorebirds are to be observed in the Lake Erie marsh lands. Among these are: coots (Fulica americana), gallinules (Gallinula spp.), pied-billed grebes (Podilymbus podiceps), great blue herons (Ardea herodias), and American egrets (Casmerodius albus). Frequent spring and fall visitors include greater and lesser yellow-legs (Totanus spp.), phalarope (Phalaropus spp.), Wilson's snipe (Capella gallinago), and various species of sandpipers (Scolopacidae).

2.35 Fish. The shallow, warm water, variety of habitats, and the organic richness have helped to stimulate the productivity in Lake Erie. The western lake basin contains a moderately diversified range of fishery habitat. Crappies (Promoxis sp.), yellow perch (Perca flavescens), white bass (Morone chrysops), bluegill (Lepomis macrochirus) and other sunfishes (Centrarchidae), bullheads (Ictalurus sp.), large and small mouth bass (Micropterus sp.), rock bass (Ambloplites rupestris), walleyes (Stizostedion vitreum), northern pike (Esox lucius), and channel catfish (Ictalurus punctatus) comprise the majority of the sport catch in the lake. Other fishes present include suckers (Catostomidae), gar (Lepisosteus sp.), bowfin (Amia calva), carp (Cyprinus carpio), goldfish (Carassius auratus), and gizzard shad (Dorosoma cepedianum). Most of these fish find suitable spawning habitats in the lake, although none have been identified within the dredging or disposal sites. The spawning habits of the white bass, catfish, bullheads and carp allow them to avoid or at least greatly minimize the stresses of sedimentation and low oxygen levels that affect coldwater bottom spawners. These fish generally spawn at depths less than 5 feet. Some species make nests for their eggs and fan and guard them during incubation; others lay their eggs on vegetation off the mud bottom; still others lay semibuoyant eggs that incubate off bottom in the water column. A short incubation period also minimizes exposure to sedimentation, low oxygen levels, disease and predation.

2.36 As reported in the 1973 Institute of Water Research, Technical Report No. 322,⁽⁹⁾ fish populations in the western end of Lake Erie were

of moderate diversity with over twenty species occurring in the project area. These species were the yellow perch, gizzard shad, white bass, goldfish, carp, white crappie, channel catfish, walleye, quillback carpsucker, pumpkinseed sunfish, brown bullhead, white sucker, longnose gar, smallmouth bass, black bullhead, emerald shiner (Notropis atherinoides), spottail shiner (Notropis hudsonius), alewife (Alosa pseudoharengus), sheepshead (Aplodinotus grunniens), silver chub (Hybopsis storeriana), smelt (Osmerus mordax), logperch (Percina caprodes), and troutperch (Percopsis omiscomaycus). In 1976, gill net samples revealed 12 species in the immediate project area from 3 collection stations. Included among these species are the alewife, gizzard shad, carp, spottail shiner, channel catfish, yellow bullhead, brown bullhead, white bass, yellow perch, walleye, sheepshead, and coho salmon (Orcorhynchus kisutch). In the spring, some fish migrate upstream, the main ones being perch, white bass, channel catfish, and carp.

2.37 In total numbers, the nine major fish species were carp, goldfish, yellow perch, white bass, gizzard shad, freshwater drum, spottail shiner, emerald shiner, and alewife, the most abundant being the alewife.

2.38 The Detroit Edison discharge canal and Raisin River stations one-half mile north were subject to considerable variability in the intensity of fish use of the area resulting from natural seasonal changes. The lake stations remain relatively constant.

2.39 Lake Erie's western basin was at one time fished heavily by commercial fishermen, but today the high value species of the past are virtually disappearing. Walleye and yellow perch are the major remaining species of high and medium value. The walleye population is increasing, and the average size of the yellow perch is declining. Populations of less valuable fish are still represented in large numbers and are generally underexploited. Included among these low value species are carp, goldfish and freshwater drum. Overfishing and a general degradation of the aquatic environment have been cited as the causes for the major changes in fish populations in Lake Erie. During the past five to seven years, the loss of desirable fish species and the discovery of high mercury levels in Lake Erie's fish has resulted in a decline in the level of commercial fishing. A sport fishery continues in the western basin, dependent primarily on populations of yellow perch, white bass, catfish, and probably to some extent, carp, goldfish, walleye, and drum.

2.40 Fish spawning and production in the western basin of Lake Erie is quite high. Larval distribution differences of a variety of species are noted increasing in abundance offshore. Day and night distributional patterns were noted with clupeids

occurring nearer the surface while most other species were highly concentrated at the bottom during the day and moved upward in the water column at night. Preliminary data indicate the majority of the larval fish are gizzard shad, though over 10 species of larvae have been identified in the water adjacent to the Raisin River mouth; (10) located 1 mile north of Bolles Harbor.

2.41 Terrestrial Life. In the surrounding wetland areas of Bolles Harbor, many mammalian species have been occasionally observed. These include the opossum, (Didelphis marsupialis), woodchuck (Marmota monax), raccoon (Procyon lotor), skunk (Mephitis mephitis), weasel (Mustela spp.), mink (Mustela vison), red fox (Vulpes fulva), and the muskrat (Ondatra zibethica). Representing the reptiles and amphibians are snakes, turtles, frogs, toads and salamanders. Ducks periodically inhabit the areas adjacent to the waterway for nesting or during migration periods.

2.42 Historical and Archaeological. The National Register of Historic Places (Fed Reg. Vol. 43, No. 26, 7 February 1978) has been consulted and subsequent issues of the Federal Register checked. Four historic sites were listed in the National Register of Historic Places as being within Monroe County, although none lie within the project area. The Fix House is located at Sterling State Park; the Navarre-Anderson Trading Post is west of Monroe; and the Rudolph Nims House and Governor Robert McClelland's House are in the city of Monroe, all away from the project area.

2.43 The State Historic Preservation Officer reviewed the proposed dredging and disposal operations for Bolles Harbor has concluded that these operations would have no effect on historical/cultural resources.

2.44 Threatened or Endangered Species. No threatened or endangered species of fish or wildlife are known to exist in the immediate project area as listed in the 14 July 1977 Federal Register. Since all work will be done in the aquatic environment or on cleared land, impacts on any endangered transient terrestrial wildlife are expected to be minimal. The Federal Register lists ten endangered and threatened species that could occur in the area. The Indiana Bat (Myotis sodalis), whooping crane (Grus americana), American or Arctic Peregrine Falcon (Falco peregrinus anatum or tundrius), Eastern Timber Wolf (Canis lupus lycaon), Brown Pelican (Pelecanus occidentalis), Kirtland's Warbler (Dendroica kirtlandii), Longjaw Cisco (Coregonus alpenae), Blue Pike (Stizostedion vitreum glaucum), and the White Cat's Paw Mussel (Epioblasma sulcata delicata) are listed, although none have been identified as existing within the project area.

2.45 The State of Michigan has published a proposed annotated list of Michigan's rare, threatened, and endangered species applicable

to Michigan. The only bird species listed that has been reported to frequent the neighboring marsh areas is the Black crowned night heron (Nycticorax nycticorax hoactili). Seven species of mussels were listed on the Michigan interim classification that may reside in the waters of, or adjacent to the navigation channel. A biological survey was conducted in June 1976 in the River Raisin one mile north to determine if any of these species were still living in the area. No rare, threatened or endangered mollusks were found during the survey of the River Raisin which was conducted in consultation with Dr. Henry vander Schalis, Curator of Mollusks, University of Michigan Museum. Although this study was conducted on the River Raisin, the similarity of bottom sediments with those of Bolles Harbor allows comparison of the species. Therefore, no rare, threatened or endangered mollusks are anticipated in the dredged materials or at the disposal site. Four fish species (Longjaw cisco, Blue pike, Cisco or lake herring, Redside dace) were listed as possibly occurring in Lake Erie, although none have specifically been found in the Bolles Harbor area. The Indiana bat was also listed as a possible visitor to southern Michigan. The American lotus (Nelumbo lutea) was listed as occurring in the shallow water and muddy shores of Lake Erie marshes in Monroe County.

2.46 The proposed list of threatened and endangered plant species (Fed. Reg., Vol. 41 No. 117, 16 June 1976) mentions two species known to possibly be found in Michigan. These are the small whorled pogonia (Isotria medeoloides) and the American Hart's tongue fern (Phyllitis scolopendrium var. americana), although neither have been found in the Bolles Harbor area.

3. RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS

3.01 The existing land use plan that encompasses the Bolles Harbor Area was developed as an integral element of the Comprehensive Development Plan for the Monroe County Region 1966 - 2000. The plan was developed by the Monroe County Regional Planning Commission in September, 1966, and includes recommendations for the general locations of residential, commercial, industrial, agricultural, governmental, recreational, and open space for Monroe County by the year 2000. The region of Bolles Harbor has been designated to remain a recreational area for public use with low density residential development of four to sixteen persons per residential acre. Industrial development will be channelized along a north-south corridor to the west of Interstate Route 75 and east and west of the La Plaisance Road Interchange.

3.02 In conformance with the Monroe County land use plan, the Michigan DNR Waterways Commission is developing plans for expansion of the public marina facility at Bolles Harbor. Maintenance dredging and the disposal facility will complement these plans. Dredging will allow continued usage of the harbor by recreational watercraft. The disposal facility will be used ultimately for recreational purposes or in conjunction with the proposed DNR facilities (parking lots).

3.03 The present land use patterns in the Great Lakes Basin Framework Study (GLBFS) Subarea 4.1 show the major portions of the 3,980,400 acres are cropland (2,215,600 acres) or forestland (665,700 acres). It is anticipated that, by the year 2020, there will be a decrease in cropland and forest land acreage, and an increase will be observed in the total urban build-up from 759,400 acres (1967) to 1,747,300 acres (2020).⁽¹¹⁾ The increase in urbanization would encourage recreational resources to develop and expand.

3.04 At one time, a portion of the Detroit Edison property was leased to the Michigan DNR and was known as the Plum Creek Bay Wildlife Area. This wildlife area was terminated with the cancellation of the lease with Detroit Edison. Therefore, there is no viable wildlife area project at this time. The Corps' confined disposal facility lies outside the former wildlife area. The operations and maintenance, as proposed, do not conflict with any known land use plans for the project area. No land loss or change in land use patterns are expected to result from project maintenance.

4. PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

4.01 General. Environmental impacts may result from harbor survey and inspection, dredging operations, after dredging survey operations, transport of dredged material, disposal of dredged material, and structural repair of the revetments. This section presents a discussions of environmental impacts associated with operations and maintenance activities of the proposed project.

4.02 The proposed action would be beneficial to man's social and economic well-being in the project area by preserving the sound structures and shallow-draft navigation channel of Bolles Harbor for use by businesses which have developed around the harbor.

4.03 Wetlands. Dredging and disposal operations of the polluted sediments, as planned, would result in the transformation of approximately 20 acres of Lake Erie waters into a terrestrial environment by construction of a diked disposal facility. No wetlands would be involved in the proposed dredging or disposal operations. Environmental impacts associated with construction of this facility were discussed in the Final Environmental Statement (FES), Confined Disposal Facility for Bolles Harbor, Michigan, October 1974. The open water disposal site for acceptable sediments is in shallow water (about 16 feet deep) in Lake Erie about 4 1/4 miles southeast (150°) from the harbor entrance into La Plaisance Bay. Repair of the existing structures under the "in-kind, in-place" policy would not affect area wetlands.

4.04 Submerged Vegetation. The navigation channel sediments do not contain attached macrophytic vegetation. Therefore, dredging operations would not impact submerged vegetation in the channels. However, during dredging operations, some nutrients in the sediments could be reintroduced into solution or suspension and transported by currents to areas having submerged vegetation.⁽¹²⁾ Some of these nutrients would benefit aquatic plant growth. However, some pollutants, such as oil and grease or metals, could be released and possibly inhibit the growth.

4.05 Disposal of the uncompacted silts and sands removed from the navigation channels may bury or smother any vegetation located at the proposed disposal site. However, divers will inspect the open water disposal site for general bottom characteristics and historical artifacts prior to disposal operations. Due to the natural turbidity in the lake and the rigorous wave induced currents, it is anticipated that few aquatic plants or algae would have colonized. Repair operations of the structures would not effect any submerged vegetation.

4.06 Water Quality. Several temporary and permanent effects on water quality can be expected to result from operation and maintenance

of the project. Temporary effects include increased turbidity, possible resuspension of contaminants, and potential spillage of oils or dredged materials during maintenance operations.

4.07 Turbidity in the channel and bay area is a natural phenomenon. Winds stir the waves during stormy weather and rains carry sediments lakeward from tributaries. Turbidity caused by dredging is related to the amount of work done, weather conditions, and sediment composition. Turbidity would result from the planned dredging and disposal operations. During dredging, whether accomplished by pipeline or bucket dredge, temporarily high turbidity will characterize the immediate vicinity of the dredge and open water disposal areas. Depending on current velocities, these highly localized turbidities would affect an area which could extend several hundred feet or more from the source.

4.08 Methods of controlling the turbidity of disturbed bottom sediments through dredging action are being investigated, although no practical solutions have been obtained. A more extensive study is also underway through the Dredged Material Research Program being supervised by the Corps Waterways Experiment Station (WES), Vicksburg, Mississippi. One of the tasks of this multi-faceted program is the investigation of the problem of turbidity and the development of a predictive capability as well as physical and chemical control methods for employment in both dredging and disposal operations. Results of these investigations have not been finalized as of this date.

4.09 Although the sediments contain silt, the levels of turbidity in the area of operation are expected to return to near normal levels within hours following the completion of dredging operations. Maintenance activities for the revetments could cause low to medium magnitude, short-term increases in turbidity levels in the harbor area waters.

4.10 Chemical water quality in the project area is not expected to be adversely affected by the proposed action. There should not occur any significant degradation of water quality because of resuspension of heavy metals, organohalogens, organosilicones, pesticides, or other major constituents. An extensive study done by the University of Southern California for the Corps, entitled The Effects of Dispersion, Settling, and Resedimentation on the Migration of Chemical Constituents During Open-Water Disposal of Dredged Material D-76-1, concluded that no significant concentrations of harmful chemicals are released into solution during open water disposal of dredged material. No significant impacts on water supply are anticipated since the closest public surface water intake is about 6.0 miles distant from the dredging site and 9.0 miles from the open water disposal location. As indicated in paragraph 4.07, the turbid conditions would extend several hundred feet or more from the source of activity, depending upon the wind

direction and current velocities. In order to minimize the potential adverse water quality impacts, these factors will be considered in scheduling the dredging and disposal operations. No deleterious effects on ground water are anticipated with this maintenance dredging.

4.11 There does exist a possibility of long-term future adverse effects on water quality. As populations increase, there will be a corresponding increase in municipal wastes requiring some manner of disposal. In similar fashion, any businesses that are attracted to the harbor are potentially capable of discharging contaminants to the surface waters of the area. Over-use of the harbor could be possible due to the transient nature of the boaters using the area. Degradation of the harbor water could occur from increased use and low water levels. Sewage wastes from the harbor area naturally would increase, so additional facilities would be required with precautions taken to minimize any overflow or spillage. This potential impact is expected to be mitigated because all businesses discharging point source wastes must meet Water Quality Compliance Standards established by the State of Michigan Water Resources Commission.

4.12 As with any navigational waterway, the potential always exists for minor oil and fuel spills during transit in the harbor. Minor environmental problems may result from such situations. Spills must be reported to the Michigan Department of Natural Resources (517-373-7660) and the Federal National Response Center (800-424-8802) for appropriate action. Public laws provide for the control and elimination of accidental waste material spills from vessels, and enforcement is provided by the U. S. Coast Guard. Government equipment and personnel and contractor's equipment and personnel involved in dredging and structural work activities are required to abide by the specifications outlined in regulation CE-1300 (June 1973) "Civil Works Construction Guide Specifications for Environment Protection." In addition, maintenance dredging plants are required to have water-tight equipment, including coamings, which must be maintained in order to prevent spillage of oils and dredged materials.

4.13 Maintenance of the structures would result in a temporary increase of turbid conditions caused by the suspension of the bottom sediments, and reintroduction of minor amounts of nutrients, organic substances, chemicals, and other oxygen demanding substances now lying in equilibrium in the bottom sediments.

4.14 Air and Noise Quality. Survey launches and tugs are powered by inboard, outboard, or inboard-outboard motors and can, therefore, be expected to release a very minor amount of oil and lead into harbor waters and gaseous pollutants, especially hydrocarbons and carbon monoxide, into the atmosphere of the project area, producing temporary, low magnitude adverse impacts on the area. These impacts are partially controlled by the fact that all Corps and contract

vessels are in compliance with USEPA standards for the control of smoke and fume emissions. Air pollution effects would probably be minor, temporary and limited to those associated with automobile and vessel exhausts, and the anticipated increase in these sources should not be sufficient to cause any problems in this area. The exhaust from the dredge during maintenance would have a minor effect comparable in extent to that of several diesel trucks. This would contribute to the volume of exhaust materials affecting air quality in the project area, but the total effect is expected to be negligible. The temporary increase in pollutants attributable to operation of the vehicle and vessel engines would not significantly effect the ambient air quality. Minor increases in suspended particulates and sulfur dioxide could be anticipated.

4.15 Structural repairs of the structures would result in the emission of a minor amount of dust, odors, and gaseous pollutants to the atmosphere in the immediate vicinity of the structures under repair, resulting in a temporary, low-magnitude deterioration of the quality of the natural environment. The Corps of Engineers would control these effects as much as possible by using equipment that complies with USEPA air quality standards.

4.16 Existing noise levels in the project area would be maintained as a result of the project. Automobiles, vessels, trucks, recreational craft, and people would continue using the area in similar numbers, and the accompanying noise is expected to continue at present levels. Dredging operations are not expected to be noticeable since they do not normally exceed 80 decibels beyond 100 feet from the dredge. Structural repair would result in minor amounts of noise in the project area. The land adjacent to the navigation channel is primarily occupied by residential and marina developments.

4.17 Aquatic Life. Dredging, disposal, and structural maintenance operations could affect the fishery resources of Bolles Harbor. High turbidities have the effect of inhibiting phytoplankton productivity by decreasing sunlight penetration and, consequently, photosynthetic activity. The net loss to the aquatic food chain in the project area, as a result of reduced photosynthesis in a limited area during construction and subsequent maintenance, would be small and is not considered significant to the Lake Erie aquatic ecosystem.

4.18 If sufficiently severe, turbidities can cause the death of larval fish resulting from the coating of gill tissues with sediment particles and asphyxiation of affected animals. The distribution of larval fish in Bolles Harbor is not presently known, although a

negative impact of dredging is the possible entrainment of fish fry. The environmental impacts of dredging would have an unknown effect on the fish populations of Western Lake Erie, although it is expected to be minor in scope. To mitigate any adverse effects on the fish, dredging and disposal operations would be scheduled to prevent interference with any fish spawning or migration activities.

4.19 The most significant effect of turbidity would probably be the exclusion of most sight-feeding game fish from the turbid zone. Researchers have shown avoidance reactions by fish to highly turbid or low dissolved oxygen areas. During dredging, fishermen would probably avoid the turbid area and fish elsewhere.

4.20 The turbidity of the dredging and disposal areas would be displeasing to some fishermen, and most recreationalists would consider the turbidity as an adverse aesthetic effect. These adverse effects are localized in scope and temporary in extent. Other areas are readily accessible to sport fishermen during these periods.

4.21 The dredging and disposal operations would have an adverse effect on benthic organisms which form a significant part of the aquatic food chain supporting the fishery resources. Disposal of dredged materials into the open water disposal site would smother some benthic organisms. Temporary turbid conditions would occur at the site when the dredge discharges its load through the bottom doors. Suspended solids reduce light penetration and, if a sufficient light loss occurs, the life cycle of certain organisms could be adversely affected during that time.

4.22 The dredging operations would be removing both polluted and unpolluted sediment capable of providing habitats for fish and benthic macroinvertebrate communities. Benthic communities can be expected to be subjected to smothering from sedimentation which accumulates. Recolonization of these areas would generally be dependent on the species' nature, mobility of organisms inhabiting the affected areas and the subsequent type of substrate.

4.23 Lee & Plumb⁽⁶⁾ postulated that burrowing organisms (Tubificidae and Chironomidae) would be favored during periods of increased sedimentation. Preliminary data from a study on "Determination of Vertical Migration of Benthos in Dredged Material Deposits" for the Corps Waterways Experiment Station indicate that juvenile hard clams and polychaete worms can migrate through at least 32 cm of sediments without apparent harm. Similar research is being conducted using certain fresh water invertebrates from the midge, mollusk, sludgeworm and mayfly groups. The final report is scheduled for distribution by June 1978. Data indicate all freshwater individuals tested could migrate through 32 cm of sediments without apparent harm except the mayfly (11 cm). The effects of sedimentation on benthos in areas adjacent to the navigation channel and disposal site should be negligible since the channel sediments contain large populations of tolerant midges and oligochaetes and the disposal site is colonized by minor numbers of the same tolerant individuals.

4.24 Recolonization can occur quickly at both the dredged areas and the disposal sites. After termination of the dredging activities, it is expected that the surviving organisms will begin recolonization. Although benthic organisms will recolonize, the species diversity could be reduced. Due to dredging and disposal, the species composition may never reach a true balance, and maximum sustained population density may never be achieved. Changes in the benthic community due to dredging operations are difficult to evaluate since the areas of operation are comprised of few species.

4.25 The cumulative effect of dredging and disposal operations on the fisheries resources in La Plaisance Bay are not expected to be significant. Four commercial fishermen are licensed in the Monroe, Michigan area, although none are registered from Bolles Harbor. The primary commercial catch is yellow perch and carp. The maintenance operations are conducted in the navigation channels and near shore areas and should minimally impact the commercial fishery operations in the area.

4.26 Wildlife. All dredging and some of the disposal operations would occur in the aquatic environment. The only impact of the proposed activities on terrestrial wildlife is a temporary, low magnitude disruption of the waterfowl, songbirds, and shorebirds that use the dike perimeter, piers, beaches, and harbor waters for resting and feeding. These species may be driven away from the immediate area by maintenance activities and noises.

4.27 Minor outbreaks of duck poisoning (botulism) have occurred on some confined disposal sites in the past both during filling operations and following heavy rainfalls. Anaerobic conditions conducive to the occurrence of botulism are recognized. It is possible to take remedial action should botulism occur on the site. This action is dependent on identifying those conditions favorable to the bacteria as they exist on the site. These conditions include warm, shallow water areas, with little or no circulation, and the presence of organic food sources in the sediments which support anaerobic organisms. These bacteria, found everywhere, produce the toxic responsible for "duck sickness" under anaerobic conditions. Once filling operations commence, small shallow ponded areas would not be allowed to form. This would be done by moving the discharge end of the dredge disposal pipe to even-out the distribution of fill. Should botulism develop at the site, the site would be flushed with lake water.

4.28 Recreation. Maintenance operations in Bolles Harbor would have an overall beneficial effect on recreation in the area. The revetment provides a recreational fishing area in the river. However, maintenance of the revetment would create minor amounts of turbidity that may be aesthetically displeasing and require fishermen using the structure to relocate during structural repair.

4.29 Maintenance of the channel would allow for the free access of pleasure craft into and out of the harbor. A temporary adverse aesthetic impact of low magnitude would result from the presence of operation and maintenance equipment in the harbor waters when viewed by persons wishing to observe this setting from the harbor area and the shoreline adjacent to the harbor. Operation of the dredge may be aesthetically displeasing to some people visiting the project area, although an operating dredge is generally a tourist attraction.

4.30 Social and Economic Factors. Operations and maintenance activities at Bolles Harbor would have a minor beneficial effect upon Monroe County population parameters such as rate of population growth and total population by encouraging future development and expansion. The project is not expected to directly affect local residential structures adjacent to the harbor, and no persons will be displaced or require relocation. Most of the land on La Plaisance Creek at the harbor is commercially, residentially, or recreationally developed, and land areas along the south shoreline are not available for further growth.

4.31 Dredging of the harbor basin and channels to the proposed depths, where necessary, would allow continual safe movement of recreational craft in the Federal navigation channels of Bolles Harbor. The maintenance of a navigable waterway would also enhance the development of water related pursuits. The navigation channel is used heavily by recreational boaters.

4.32 Local businesses depend upon the commerce generated by the fishermen using the harbor area. In turn, this would have an indirect long-term beneficial effect upon revenue, employment, and earnings in Monroe County. Operation and maintenance of the harbor would not detract from local businesses. It is anticipated that the project would have no direct, short-term effect on revenue, employment, or earnings of the wholesale trades industries in Monroe County. These industries are not expected to experience significant sales losses due to temporary inconveniences during the operation and maintenance activities conducted at Bolles Harbor. The project would have a direct impact on the continued use of the harbor for recreational boating by local and regional residents. The project would have an indirect long-term beneficial effect of medium magnitude on the revenue, employment and earnings of retail trade industries due to the stimulating effect harbor activities have on local marinas in general.

4.33 The fuel consumed during survey and inspection, dredging, transport, disposal, and structural maintenance is irretrievably lost. Operation and maintenance of the harbor would allow for continued use of this channel by recreational boaters, thus increasing fuel use directly related to harbor activities. The exact impact of future traffic activities at Bolles Harbor upon energy resources cannot be determined. Fuel consumption would also be affected by the

number of people using motor vehicles to arrive at Bolles Harbor. Harbor maintenance would provide local opportunities for recreational activity for the community, thus reducing motor vehicle traveling distances and fuel consumption for the local populations, if they were forced to journey elsewhere for such recreation.

4.34 Components of the existing human environment which are not expected to be directly affected by continued operation and maintenance of the La Plaisance Creek are demographic and cultural resources. However, these components would be indirectly affected to a moderate degree for continued operation of businesses dependent upon water related activities and would promote the continued desirability of the harbor as an recreational port. This impact would promote a corresponding growth in public facilities available to the population via expanded tax revenues. Other human environmental components that would be affected to some degree by one or more of the project activities are: land and water uses, transportation, structures, local business, employment and income, recreation, and quality of the human environment. A negative secondary effect of the project in the light industrial zoned areas would be the alteration of any existing vegetation during any recreational expansion. Additional development will require land or water areas for construction, and storage facilities, all entailing a negative impact on the existing environment, while at the same time improving job and recreational potentials for the area and state.

4.35 The project would have neither a beneficial nor an adverse short-term effect on local housing parameters such as repair and maintenance of existing structures, changes in home ownership, or percent of owner occupied homes. This project, and future operation and maintenance projects in the harbor, would have a long-term beneficial effect of moderate magnitude upon these parameters by preserving the desirability of the harbor as an recreational port, thereby promoting business growth with the resultant taxes and increases in property values. Since there is minimal waterfront property available for new construction, the project would have a minor beneficial effect upon new business construction within the immediate area. The project would not destroy land areas. It is not likely that it would stimulate a change from current occupancies.

4.36 No impacts on highway structures are anticipated. No bridges or highways cross the creek in the project area.

4.37 Flooding and Bank Erosion. The maintenance operations would not affect flood or high water problems that occasionally affect the western Lake Erie area. The navigation project could affect bank erosion in the project area if recreational boaters exceeded posted speed limits in the harbor.

4.38 Commercial Fishing. There are four commercial fisheries operating in the Monroe area. Although no fisheries are registered out of Bolles Harbor, commercial fishing vessels occasionally dock there. This project would have neither a beneficial nor an adverse effect upon local revenue, employment, or earnings within this industry.

4.39 Archaeological and Historical Sites. Four historic places have been listed within Monroe County, but none are within the project area. The project is, as proposed, involves only the removal of recently deposited sediments from authorized channels and repair and maintenance of structures. In view of the fact that the project does not entail any new work not covered in the confined disposal EIS or any maintenance work in previously undisturbed areas, it is very likely that it would not affect any local undiscovered archaeological resources. Should maintenance personnel discover objects of possible archaeological significance, operations would cease and consultation sought with the State of Michigan to evaluate the find and to supervise salvage operations, if needed. Communication with the Michigan State Historic Preservation Officer indicates that the proposed project would have no effect on sites nominated for or included in the National Register of Historic Places. Prior to disposal operations an inspection would be conducted by Corps divers to insure that no historical artifacts are present.

4.40 Threatened or Endangered Species. Threatened or endangered species that may reside in the project area are listed and discussed in Section 2. Mammals, birds, fish, plants, and other wildlife that are listed in the Federal or State guidelines as endangered or threatened, and may reside in the project area, are not expected to be impacted by the maintenance dredging operations and structural repair of the harbor revetments.

4.41 Regulations Concerning Dredging Projects. Several Federal regulations addressing dredging and disposal operations have been issued in recent years by both the Corps of Engineers and the Environmental Protection Agency. These regulations have certain requirements regarding assessment, public notification, and coordination.

4.42 On 22 July 1974, the Corps of Engineers published regulations covering all of its dredging operations. This regulation, 33 CFR 209.145, has provisions for issuance of a public notice, holding of public meetings or hearings if required, coordination of planning with State and Federal agencies, and final approval of disposal sites by EPA. All of the requirements of this regulation would be met prior to beginning maintenance of the project.

4.43 On 5 September 1975, the USEPA published regulations for discharge of dredged or fill materials in navigable waters (40 CFR 230). This regulation requires that consideration be given to wetlands, fisheries, shellfish, water quality, benthic organisms, submerged vegetation, nutrients, turbidity, threatened or endangered

species, wildlife and recreation. Each of these items has been addressed in detail in preceding paragraphs. In accordance with paragraph 230.5 of this regulation, plans include all practical measures to minimize adverse effects and enhance beneficial effects. The proposed action is in compliance with the requirements of the regulation.

4.44 Remedial and Mitigative Measures. During normal maintenance dredging operations, every effort is made to minimize or deter any adverse effects. The inconvenience encountered by pleasure, fishing, and commercial operators can be alleviated through advance notification to the public via public notice publication at marinas, sports equipment shops, yacht clubs and harbor facilities, local mariners' publications, and placement of navigation aids by the U. S. Coast Guard to designate the working areas. Open water disposal would be conducted while the barge speed is reduced to minimize the bottom area influenced by the release of sediments through the bottom doors or through a stationary pipeline. Only uncontaminated materials, as classified by Region V, USEPA, would be disposed of at the open water disposal location. Only the specific disposal area would be used, and, if other locations are needed, a public notice would be issued and clearance obtained from the State Historic Preservation Officer and other governmental agencies.

4.45 Conclusions. Generally, maintenance dredging operations cause periodic, short-term, localized problems attributed to turbidity, suspended solids, and sedimentation. During dredging, nutrients and heavy metals may be released from the sediments where they have been in a stable, non-reactive status. Water quality and nektonic, planktonic, and benthic habitats would also be adversely affected. According to the U. S. Fish and Wildlife Service, recolonization can occur quickly in the dredged areas. Although benthic organisms would recolonize, the species diversity could be reduced. Due to the dredging and disposal, the species composition may never reach a true balance, and maximum sustained population density may never be achieved.

4.46 The biology and ecology of an aquatic system is very complex. Researchers generally agree that unstressed aquatic areas contain large number of taxonomic groups with few individuals in each. Conversely, highly stressed areas may contain thousands of individuals usually represented by very few species. Bolles Harbor contains a small number of taxonomic groups. The navigation channels were comprised of tolerant species.

4.47 Minor, temporary interference with recreational boating activity could occur during the dredging period. The presence and operation of the dredging equipment could possibly result in a very brief delay in the operation of a few of the recreational craft that visit or use Bolles Harbor. The employment of small, shallow-draft bucket or pipeline dredges would minimize such disruptions to navigation.

4.48 In addition to the Corps and EPA regulations that govern maintenance operations, Section 122 of Public Law 91-611 presents possible areas of impact that should be considered in relation to the proposed operations. These areas include, but are not limited to:

Noise	Public Services
Displacement of People	Desirable Regional Growth
Aesthetic Values	Employment
Community Cohesion	Business and Industrial Activity
Desirable Community Growth	Displacement of Farms
Tax Revenues	Man Made Resources
Property Values	Natural Resources
Public Facilities	Air Pollution
(including water supplies)	Water Pollution

During the on-going planning for the proposed maintenance operations, these aspects were evaluated. These parameters have been discussed in Section 4. No detrimental, long-term impacts are anticipated from maintenance operations of the navigation channels.

4.49 Future dredging needs at Bolles Harbor are uncertain. Reductions of untreated and partly treated wastes, urban storm runoff, agricultural wastes, and wastes from small craft would result in reduced sediment loadings to the channels with the potential for less dredging. Certain harbor sediments now classified as contaminated and unsuitable for open-lake disposal may be reclassified as suitable for open-lake disposal in the future, thus alleviating the need for long-term confined disposal sites.

4.50 Specific future industrial or commercial development plans for the harbor area are not known at the present time. However, if Bolles Harbor is to maintain its viability as an attraction for recreation, the areas presently zoned for light industry must remain available for recreational or industrial expansions. Land and water areas would be altered from their present state by this activity, and would no longer function as they presently do.

5. ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

5.01 Those adverse effects which cannot be avoided in the execution of operation and maintenance activities include survey and inspection operations, dredging operations, transport of dredged materials, disposal operations, sweep survey and structural maintenance.

5.02 Survey and Inspection Operations. During normal operations a short-term, low magnitude inconvenience to a few recreational boaters who must avoid the work areas in the harbor or channels could occur. Short-term, low-magnitude adverse impacts on local, natural, environmental quality caused by the release of small amount of oil and lead from the project vessels into the harbor waters, and gaseous pollutants and noise into the harbor atmosphere is also a possible impact.

5.03 Dredging Operations. During dredging operations, the following situations could develop: minor, short-term inconveniences of low-magnitude caused by maintenance vessels to a small number of recreational boaters who must avoid the local work area; a short-term low-magnitude increase in pollutant levels caused by motors used to power the dredging equipment releasing small amounts of noise and gaseous pollutants into the atmosphere; short-term disruption of benthic and planktonic communities, as well as the displacement of nektonic organisms; short-term, minor magnitude adverse impacts due to possible increases in turbidity, COD, solids, and nutrient levels, and decreases in dissolved oxygen levels in the water column and in the down-current direction, depending upon prevailing wind and lake current conditions during dredging and disposal operations; temporary emigration of fish from Bolles Harbor navigation channels until such time as water quality improves and turbidity decreases, possibly resulting in temporary reduction in recreational fishing potential; and prevention of the re-establishment of a mature benthic community regardless of improvements in the quality of the sediment, caused by maintenance dredging on a periodic basis.

5.04 Transport of Dredged Materials. Short-term, low-magnitude adverse impacts on local air quality caused by the engines of the dredge equipment could occur from minor amounts of noise and gaseous pollutants being released into the atmosphere. Minor short-term inconveniences caused by the equipment could be anticipated to disturb a small number of recreational or commercial navigators and fishermen who must avoid its path. Minor leaks or spills could occur, but this situation should be short-term.

5.05 Disposal Operations. This activity could disrupt portions of 160 acres of lake bottom benthic habitat and fish populations (the area inside the open water disposal site for dredgings). Some benthic organisms may be able to burrow up through the freshly

deposited dredged materials, but the remainder would be lost beneath the deposited materials. Long-term impacts could be the prevention of the re-establishment of a mature benthic community at the open water disposal site. Disposal of dredged sediments to the confined disposal site would remove aquatic fauna and flora and eventually change the aquatic area to a terrestrial site. Localized, short-term, low-to-medium magnitude effects on air quality, aesthetics, and aquatic and terrestrial organisms adjacent to the channel could also occur.

5.06 Sweep Survey. During the sweep survey activities, short-term, low-magnitude inconvenience to a few recreational boaters who must avoid the work areas in the harbor or channel could occur. Short-term, low-magnitude, adverse impacts on local natural environmental quality caused by the release of a small amount of oil and lead from the project vessels into the harbor waters and gaseous pollutants and noise into the harbor atmosphere could also be anticipated.

5.07 Structural Maintenance. Structure repairs could result in: short-term, low magnitude inconveniences to a few local recreational boaters and fishermen who would be forced to avoid project vessels in the harbor area; short-term, low-magnitude deterioration of the natural environment caused by the emissions of a minor amount of noise, dust, odors, and gaseous pollutants to the air, as well as increased turbidity in the water during structural repairs; and temporary, low-level adverse impacts on aquatic invertebrates and fish by displacing some of them temporarily from the immediate area during structural repair.

6. ALTERNATIVES TO THE PROPOSED ACTION

6.01 The proposed action involves the periodic maintenance dredging of Bolles Harbor, Michigan, Federal Navigation Channels by the U. S. Army Corps of Engineers, as authorized by Congress. This involves the removal of the shoaling sediments from the navigation channels and disposal of dredged materials into both the open waters of Lake Erie and the yet to be constructed confined disposal facility.

6.02 Alternatives to the proposed action can be separated as dredging alternatives, disposal alternatives, and structure maintenance alternatives.

6.03 Dredging Alternatives. Four alternatives can be considered under this category: (1) discontinue maintenance dredging, (2) maintain alternative channel dimensions, (3) alternative dredge types and (4) dredge only the critically shoaled areas.

6.04 (1) Discontinue Maintenance Dredging (No Action). This alternative would jeopardize recreational traffic and would hamper all water activities. Within a few years, accumulated sediments would reduce channel utilization. The average depth of the inner harbor channel is currently about 2 1/2 feet deep with about 3 1/2 feet of shoaling. This area has an annual shoaling rate of about 6 inches per year. The depth of the outer channel in Lake Erie averages about 5 feet, with about 3 feet of shoaling. Due to the changing wind and current directions, the exact rate is unknown. This filling rate is dependent upon sediment loadings to the creek, the nature and duration of storms, and long shore currents in the lake. If no dredging occurs, individuals and enterprises dependent on this mode of transportation and recreation for their livelihood would suffer economically. Users of the harbors may eventually find that increased shoaling which limits access to the harbor is both dangerous and undesirable and may wish to relocate to areas that maintain the navigation channels. On the other hand, should maintenance of Bolles Harbor be discontinued, the funds allotted for this purpose would be transferred to another project. Any temporary inconvenience to recreational boaters would be eliminated. The potential adverse air and water quality conditions would not occur. The benthos and fish populations would not be disturbed, and an established mature benthic community could be maintained. Due to the potential deterioration of the recreational and social environments which would result from this alternative, it was not considered further.

6.05 (2) Maintain Alternate Channel Dimensions. Dredging to a lesser depth would jeopardize recreational vessels with drafts approaching the shallower depth. Excessive shoaling would create unsafe conditions for the operation of deeper draft recreational

vessels (cruisers, sailboats). The lesser depths would limit the drafts of vessels wanting to use the harbor facilities. As explained in paragraphs 2.05-2.07, the water levels at Bolles Harbor are affected by strong winds and gales and by seiches. These conditions could result in critical navigation problems for vessels utilizing a shallower harbor. Insufficient maintenance would discourage utilization of the harbor facilities, resulting in environmental degradation and economic losses. The economics of dredging to 4 feet as compared to 8 feet does not cut dredging costs proportionately since the cost for mobilization and demobilization remains constant. A confined disposal facility was designed and constructed to contain the sediments classified by the U.S. EPA as contaminated. The capacity was for a period not to exceed ten years of dredging. A recent reclassification has greatly reduced the quantity of material requiring confinement resulting in a questionable completion date of a filled facility. Should the District Engineer determine a lesser depth adequate to allow safe channel navigation, this alternative would be acceptable. To dredge to a greater depth, Congressional approval would be required.

6.06 (3) Alternative Dredge Types. The type of dredging equipment and the method used to accomplish the most economical and the most engineeringly efficient dredging depends upon the composition of the material to be dredged, dredging depth, transportation distance from dredging site to disposal location, dredge availability, and the capability of the dredge to minimize any pollution during the operations.

6.07 Dredging equipment is classified as either mechanical (bucket) or hydraulic. The basic types of mechanical dredges are limited to discharging alongside the place of excavation or into scows or barges for rehandling. A bucket dredge is utilized around docks, piers, and corners of cuts by a grab bucket operated from a derrick mounted on a flat-topped barge. The dipper dredge is most effective in hard materials, i.e., hard clay and rocks, and is fundamentally a power shovel operated from a barge.

6.08 The basic hydraulic dredge types are pipeline-cutterhead and hopper. The pipeline-cutterhead and hopper dredges utilize a centrifugal pump through which the material is passed. The hopper dredge uses trailing drag arms with special dragheads that must be in contact with the bottom, and dredges while in motion. A pipeline-cutterhead dredge has a cutter attached to the forward end of a ladder, which is connected by a shaft to the cutter motor that rotates, and the agitated material is picked up by suction. Both the hopper and cutter dredges can convey the dredged material to the disposal site through pipelines, which may be placed on floats, on land, or in combination thereof.

6.09 Strict cost comparison of different dredge removal operations

can be misleading. Each type is best suited for a particular job. Location, dredging quantities, sediment type, and disposal method affect costs, so this information must be taken into consideration prior to decision-making.

6.10 (4) Dredging Critically Shoaled Areas. Should funds and/or benefits decline for maintenance operations at Bolles Harbor, dredging of only the critically shoaled areas would be accomplished. This alternative would allow for safe navigation until the entire project could be maintained. This would not constitute a solution to the problem and would only temporarily alleviate the situation. Economically it would be a negligible savings since the costs for utilization of the equipment would remain inherent in the project. Environmentally, it is a temporary, acceptable procedure.

6.11 Disposal Alternatives. Seven alternatives for disposal are discussed: (1) all material disposed in open water; (2) confinement of uncontaminated sediments; (3) upland disposal; (4) pretreatment of material, (5) deep (over 100 feet) water disposal, (6) beach nourishment, and (7) marsh creation.

6.12 (1) All Open Water. Open water disposal of contaminated sediments would conflict with a request made by the Governor of Michigan to discontinue disposal of such sediments in the open lake waters. The Environmental Protection Agency, Region V, has stated that some of the sediment in Bolles Harbor is unsuitable for open lake disposal. The Corps operates under Code 33 CFR 209.145 (b)(1) governing open water contaminated dredged sediments.

6.13 (2) Confinement of Uncontaminated Sediments. Disposal of sediments to a confined disposal facility is not economically sound due to the construction costs of a diked area and lack of sufficient adverse impacts to justify those costs. If a confined disposal site is provided by the private sector, and is available at no cost to the Federal Government, the Corps has the authority under such conditions to dispose into the site. No such sites have been provided at Bolles Harbor.

6.14 (3) Upland Disposal. Upland disposal requires an inland discharge area and pipeline, or other means of conveyance. Inland disposal sites are relatively scarce, normally privately owned, and being used for solid waste disposal. Use of marsh areas for sediment disposal is ecologically unwise and the process of long distance piping has economical, engineering, and logistical drawbacks.

6.15 It is a Corps policy to secure the maximum practicable benefits through the utilization of materials dredged from authorized navigation channels and harbors, provided extra cost to the Government is not incurred. Access to disposal pumpout facilities for inland

sites would normally require a new channel and turn around area. Construction of additional channels and pumpout facilities would probably be more disruptive of the environment than the proposed open water discharge of uncontaminated materials.

6.16 (4) Pretreatment. Treatment of dredge material before disposal could be accomplished in several ways: (1) local sewage treatment works; (2) separate onshore treatment plant; and (3) on-board treatment prior to in-lake discharge.

6.17 Assume the removal of a moderate amount of dredging, i.e., 1,000 cubic yards of material per day. An 0.5 percent slurry of that amount would be a volume equivalent to the wastewater discharge of 0.25 million people (10). Existing sewage treatment plants do not have the capacity to treat these additional volumes. Costs for new treatment plants are prohibitive and chemical treatment to settle the suspended solids is expensive. In addition, chemical flocculation in conjunction with open lake disposal could cover lake bottoms with sediments unsuitable for biological production.

6.18 (5) Deep Water Disposal. The alternative of discharging unpolluted sediments to open water areas greater than 100 feet deep has been suggested to diminish disruption of the ecological system. To reach waters of this depth would involve a trip over 130 miles one way to a location in Lake Huron, the closest area with waters that deep. Increased travel times to the deep water area and the safety of the crews while navigating these sometimes turbulent body of water are considerations for this alternative. Increased costs for this type of operation are not substantiated by any perceived benefits.

6.19 (6) Beach Nourishment. At the present time, the main concern of areas along the western end of Lake Erie is flood control protection. When the lake levels are lower, perhaps this alternative could be considered further. It is a policy of the Corps of Engineers to secure maximum practicable benefits through the utilization of materials dredged from authorized navigation channels and harbors, provided extra cost to the Government is not incurred. In the utilization of sand for beach nourishment, the technical advice of the Coastal Engineering Research Board must be obtained in determining the beaches most urgently in need of replenishment.

6.20 (7) Marsh Creation. Under Section 150 of the Water Resources Development Act of 1976 (PL 94-587) wetland areas can be established as part of the water resource development projects. A marsh habitat would include a diversity of non-woody plant communities able to compete successfully on wet or periodically inundated soils. This alternative is being investigated with representatives of the Michigan DNR. The site under consideration is State-owned bottomlands. Coordination will also be conducted with the U.S. F&WS. This alternative may be undertaken at some future date for the Bolles Harbor project. The Corps is pursuing coordination of the necessary approvals at this time.

6.21 Structure Maintenance. The only alternative would be "no action". If the revetments are not maintained, wind and wave erosion would eventually cause structure failures. In time, the harbor would be left unprotected and unsafe for navigation.

7. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT
AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

7.01 In order to evaluate the environmental relationships that could be expected to occur as a result of implementing operation and maintenance activities at Bolles Harbor, the following definitions have been applied.

a. "Local short-term uses" are defined as operation and maintenance activities within the harbor environment and the impacts of these activities.

b. "Man's environment" includes the physical, biological, economic, and social components influencing the human community.

c. "Maintenance and enhancement of long-term productivity" is defined as the promotion of future activities of conditions beneficial to the natural and human environments expected to occur within the effective lifetime of the existing navigation channel at Bolles Harbor.

7.02 The major short term effect of intermittent dredging of the authorized Federal Navigation Channel at Bolles Harbor is that small craft with light draft could continue to utilize harbor facilities. Continuance of recreational craft movement at Bolles Harbor avoids economic burdens to those dependent upon marine related activities.

7.03 Human productivity within the areas at the harbor would benefit from continued maintenance dredging operations and subsequent use of the river. The navigation channel would continue to provide economic opportunities to owners of marinas and other business offering services associated with water-related activities.

7.04 Removal of accumulated sediments would have a beneficial effect upon the long-term productivity by keeping the channel available for navigation. The benthic habitat removed by dredging could not be immediately replaced. Benthic populations would not equal those of undisturbed areas as long as the channel is maintained. Structure maintenance would continue to keep the harbor safe for navigation.

8. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED.

8.01 Implementation of the proposed project would result in the expenditure or elimination of various natural and human resources. In order to evaluate resource commitments that could be expected to occur as a result of proposed project activities at the Bolles Harbor navigation channel, the following definitions are made.

a. "Irreversible or irretrievable commitments" are defined as those commitments of resources for periods of no less than 50 years.

b. "Natural resources" are defined as the physical and biological components identified in Section 2, including hydrology, physiography and geology, plant and animal life, bottom sediments, and the aquatic ecosystem.

c. "Human resources" are defined as those environmental components directly associated with man's activities, including land and water uses, transportation, structures and utilities, public services and facilities, industry and business, employment and income, recreation, demography and cultural resources.

8.02 Intermittent maintenance dredging of the channel at Bolles Harbor would prevent the long-term establishment of a diversified community of benthic macroinvertebrates. Currents in Lake Erie could disperse turbidity arising from dredging, thereby creating siltation which would effect aquatic habitat not specifically within the actual harbor maintenance areas.

8.03 The labor, capital, and material resources expended in the planning and maintenance of this project represent irreversible and irretrievable commitments of human, economical, and natural resources. Fuel consumption during survey inspection, dredging, transporting, disposal, and structural maintenance is irretrievably lost. Harbor maintenance operations would allow for continued channel utilization by recreational boaters, therefore directly increasing fuel utilization in harbor activities. Fuel consumption would also be affected by the vehicles needed to travel to Bolles Harbor. Maintenance of the harbor would provide continued recreational opportunities for local populations, thus reducing traveling distances and fuel consumption.

8.04 No changes or alterations in present land use are anticipated from the proposed operations. No archaeological or historic sites have been identified as being affected, so the activity would not affect cultural resources.

8.05 Most of the dredged material discharged at open water disposal sites will be permanently lost to the shoreline from which much of the material was eroded.

9. COORDINATION WITH OTHERS

9.01 Public Participation. Public meetings, hearings, or workshops were not held concerning maintenance dredging, disposal operations, or structure maintenance in the past because the harbors and navigation channels were established as the result of Congressional legislation and the maintenance thereof was inherent in the Federal jurisdiction over navigable waterways.

9.02 Public Notice. The current practice is to issue a Public Notice of the intent to perform maintenance dredging in the specified Federal Navigation Channels and/or Harbors. The proposed dredging plan is reviewed under the following laws: Fish and Wildlife Act of 1956; Fish and Wildlife Coordination Act of 1958; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Federal Water Pollution Control Act of 1972; Endangered Species Act of 1973; Water Resources Development Act of 1976; as well as the various Congressional Acts authorizing construction and maintenance of the Federal project.

9.03 Any person who has an interest which could be affected by the disposal of this dredged material may request a public hearing. The request must be submitted in writing to the District Engineer within thirty (30) days of the date of the notice and must clearly set forth the interest which could be affected and the manner in which the interest could be affected by this activity.

9.04 A public notice describing the proposed maintenance dredging at Bolles Harbor was originally issued 15 March 1977. Copies of this notice were sent to governmental agencies, citizens' organizations, and individuals. Seven responses were received and are summarized in paragraph 9.06. Another public notice will soon be issued to notify the government officials and public of the reclassification of 1,300 feet of the navigation channel from polluted to unpolluted and suitable for open lake disposal. No adverse comments are anticipated in response to this updated public notice.

9.05 Government Agencies. As noted in 9.04, government officials were first notified of the project proposals through direct mailings of the Public Notice. Copies of this notice were sent to the Environmental Protection Agency, the Department of the Interior, the Department of Commerce, the Coast Guard, the State of Michigan, Monroe County, and other Federal, State and local agencies.

9.06 Three Federal governmental agencies expressed their opinions. Due to budget and staff limitations, the U. S. Department of Commerce was unable to review the public notice. The U. S. Department of the Interior

recommended upland disposal of the dredged materials as opposed to open-lake disposal and also recommended various beneficial uses of the sediments. The U. S. EPA did not object to the proposed operations and did indicate no dredging of the polluted materials should be done until the confined disposal facility is completed. It was also requested: that wind direction and lake currents be considered in scheduling the dredging and disposal operations; water intake facility operators be notified so operations could be halted should the need arise; that the proposed operations be conducted at times to prevent interference to fish spawning and migration periods and locations; and that precautions be taken to mitigate adverse effects on benthos, nursery, and feeding grounds.

9.07 Citizen and Environmental Groups. The proposed Public Notice of March 1977 was mailed to organizations and individuals. Postmasters in the area of interest were requested to post this notice for a period of 30 days.

9.08 Four citizen or environmental groups also responded to the March 1977 public notice. The Lake Erie Advisory Committee opposed the proposed diked disposal site as they contended it would be in the Plum Creek Bay Wildlife Area. Correspondence from the Michigan DNR substantiated the Corps position that the so-called "Plum Creek Bay Wildlife Area" died with the cancellation of the lease with the Detroit Edison, and the proposed disposal site lies outside the former wildlife area. The Lake Erie Cleanup Committee, Inc., objected to open water disposal of the sediments. Michigan United Conservation Clubs (MUCC) objected to the method of disposal, would like a proposal for long-term wildlife management, would like to see clean dredged materials utilized for marsh restoration or beach nourishment, questioned the status and boundaries of the Plum Creek Bay Wildlife Area, and suggested that proposed maintenance operations provide the impetus for starting resource management. Concern about the Plum Creek Bay Wildlife Area was expressed by the Monroe County Rod and Gun Club, Inc. Similar comments were received from circulation of the DES and have been addressed in the comment and response area of this section (pages 41 to 52).

9.09 Coordination of DES. Prior to preparation of the draft environmental statement, the U. S. Department of the Interior, U. S. Environmental Protection Agency, Michigan State Historic Preservation Officer, Michigan Department of Natural Resources, and the Southeast Michigan Council of Governments were requested to review the proposed activities and indicate any concerns with regard to the project, so that the significant impacts could be addressed. The response from the U.S. Department of the Interior, Fish and Wildlife Service, concluded that there are no known threatened or endangered species in the project area and recommended initiation of the formal consultation process should the investigations disclose endangered species or their habitats. The U.S. Environmental Protection Agency suggested

addressing the potential impacts that may affect migrating bird populations and fishing resources, considering the amount of wetlands that have already been lost in the project area, investigating the potential for marsh and discussing the Michigan Department of Natural Resources marina that is under consideration. The Michigan State Historic Preservation Officer concluded that the proposed activities would have no effect on cultural resources. A response from the Michigan Department of Natural Resources listed seven mussels that could be found in the general vicinity.

9.10 This Draft Environmental Statement was sent to the following governmental agencies and public groups for their review:

- Advisory Council on Historic Preservation*
- Federal Energy Regulatory Commission*
- U. S. Department of Agriculture-Forest Service*
- U. S. Department of Agriculture-Soil Conservation Service*
- U. S. Department of Commerce, NOAA*
- U. S. Department of Health, Education & Welfare
- U. S. Department of Housing and Urban Development
- U. S. Department of the Interior*
- U. S. Department of Transportation-U.S. Coast Guard*
- U. S. Environmental Protection Agency*
- State of Michigan - Department of Natural Resources*
- State of Michigan - Department of Commerce
- State of Michigan - State Highways and Transportation
- State of Michigan - State Historic Preservation Officer
- Michigan Conference of Archaeology
- Sierra Club
- Michigan United Conservation Clubs*
- League of Women Voters
- National Audubon Society
- City Governmental Agencies
- County Governmental Agencies
- Southeast Michigan Council of Governments (SEMCOG)*
- Concerned Private Citizens and Environmental Groups

*Indicates comments received on the DES.

Comments received are addressed in the following section with appropriate responses. Copies of the response letters are attached for reference (pages 57- 76).

COMMENT AND RESPONSE

ADVISORY COUNCIL ON HISTORIC PRESERVATION.

1. Comment: Thank you for your request of September 30, 1977, for comments on the environmental statement for Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan. Pursuant to Section 102 (2) (C) of the National Environmental Policy Act of 1969 and the Council's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800), we have determined that your draft environmental statement appears adequate concerning our area of interest, and we have no further comments.

Response: Noted.

FEDERAL ENERGY REGULATORY COMMISSION:

1. Comment: The staff concentrates its review of other agencies' environmental impact statements basically on those areas of the electric power and natural gas industries for which the Commission has jurisdiction by law, or where staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in these areas of concern nor serious conflicts with this agency's responsibilities should this action be undertaken.

Response: Noted.

2. Comment: Our review, however, has focused attention on the following:

1) The statement does not provide sufficient cost data to determine whether additional Federal expenditures are justified and to what extent.

2) Page 1, Section 1.03 - States that part of the original project justification was for a "Harbor of Refuge." Yet, 10 years later, it still remains to be designated as such.

3) Page 10, Section 2.09 - Since 2/3 of the harbor usage is by boats under 20 feet in length, how many of the remaining vessels are of the deep draft type? Has the relocation of these recreation vessels at a nearby deepwater harbor been considered as an alternative?

4) Unpolluted dredged sediments should be utilized in useful landfills, not in deep water disposal.

5) Sediment control at sources should be considered over repeated harbor dredgings.

Response:

1) A benefit/cost ratio is not required for operations and maintenance projects. The District Engineer considers the history of the project area, funds available, priorities, and the immediate needs of the area in recommending maintenance operations for each harbor.

2) The original project justification was only for a recreational harbor. The Michigan DNR requested the harbor to be designated as a Harbor of Refuge. In order to remove confusion, this statement was eliminated from the final statement.

3) No deep draft vessels use the harbor. The maximum draft is 6 feet. This information was extracted from a study from the Michigan DNR on the amount, types and patterns of use of licensed watercraft in the State. Since the study did not have a breakdown of lengths of watercraft and the statement doesn't support the information in the paragraph, the sentence has been removed from the final statement. The closest deepwater harbor is Monroe, about 2 1/2 miles northeast, which is a commercial harbor and has been developed primarily for receipt of coal. Some recreational boating has been observed, although this is limited due to the absence of marinas. Development of marinas would necessitate filling of sections of the Lake Erie shoreline and marshlands that would provide more advantages to county residents by remaining open and unfilled than by being filled and developed. The Corps is looking at the long-term impacts of the Monroe harbor and the possibility of widening and deepening the harbor to accommodate larger draft vessels.

4) It is a Corps policy to secure the maximum practicable benefits through the utilization of materials dredged from authorized navigation channels and harbors, provided extra cost to the Government is not incurred. If the marsh creation alternative is resolved, the uncontaminated materials would be used to develop this area. Until such time, disposal would be into the open lake. Please refer to the discussion of marsh creation in Section 6.

5) Land management for soil erosion control could reduce the need for maintenance dredging. The Waterways Experiment Station of the U.S. Army Corps of Engineers and Federal and State conservation and land planning units are involved in watershed erosion control studies and implementation projects. Construction of revetments and other structures could be costly and impractical. Coordination and funding of land use planning and zoning plans are local matters and beyond authority of the Corps.

U.S. DEPARTMENT OF AGRICULTURE-FOREST SERVICE.

1. Comment: Since dredged material will be deposited in open water, we anticipate no significant impact on forested land from this project.

Response: Noted.

U.S. DEPARTMENT OF AGRICULTURE-SOIL CONSERVATION SERVICE.

1. Comment: We have reviewed the Draft Environmental Statement for Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan, and do not have any comments.

Response: Noted.

U.S. DEPARTMENT OF COMMERCE - NOAA

1. Comment: The proposed maintenance dredging in Bolles Harbor and disposal of clean spoil in Lake Erie will have, in our opinion, only insignificant permanent effects on water quality of Lake Erie.

Response: The effects are insignificant and not necessarily permanent. The minimal, localized water quality degradation should not create any major ecological concern due to the short-lived nature of the impacts. Recolonization by some benthic organisms would occur after termination of the proposed activities. This would be determined by the nature of the species, mobility of the organisms, and the type of substrate.

2. Comment: Discussion of alternatives for clean spoil disposal appears to be insufficient. Statement rejects the use of marsh areas for sediment disposal as ecologically unwise (par. 6.14); however, it does not consider an alternative of creating or restoring a barrier beach for protection of marshlands.

Response: The discussion on disposal alternatives has been expanded to address beach nourishment and marsh creation. The statement concerning use of marsh areas for disposal as ecologically unwise was meant to infer that filling and destroying marshlands with dredged sediments is ecologically unacceptable.

U. S. DEPARTMENT OF THE INTERIOR.

1. Comment: The U. S. Department of the Interior has reviewed the draft environmental statement (EIS) for Operation and Maintenance of the Federal Navigation Channel and Structures at Bolles Harbor, Monroe County, Michigan. We find the draft EIS is generally adequate in its assessment of the environmental impacts resulting from the project in all areas except the open-lake disposal of the unpolluted dredge materials.

Response: Noted.

2. Comment: We have stated in a response to your March 15, 1977 public notice (NCECO-0-33-B) for maintenance dredging on this project, that our policy generally recommends upland disposal methods as opposed to open-lake dumping. From the facts presented in the draft EIS it cannot be determined if disposal of approximately 80,000 cubic yards of unpolluted dredge material on approximately 160 acres of lake bottom will be beneficial to the aquatic environment. As outlined in the statement, most impacts of open-lake disposal would be of a negative character on any plants or benthic organisms at the site.

Response: Upland disposal would be accomplished if the site was available and the additional handling costs resulting from this method of disposal of uncontaminated materials was not assigned to the Government. The impacts incurred from open-lake disposal would be unavoidable and cannot be overlooked. Nevertheless, the impacts are not permanent and would be temporary and localized. Due to the strata and materials to be open-lake disposed, recolonization is anticipated to occur quickly after the disposal operations cease. The significance of expected impacts does not appear to justify major expenditures to provide land disposal sites.

3. Comment: Studies conducted on the effects of open-lake dumping on certain parameters are forthcoming (January 1978) from a Corps of Engineers project conducted off Ashtabula, Ohio. Some effects of open-lake disposal on benthic organisms are known and have been documented, but many more questions concerning the effects open-lake dumping may have on the total ecosystem are unanswered. Until more information is gathered on the effects of open-lake dumping, we will continue to recommend upland disposal. Since the materials were swept from the land into the channel, it seems apparent to us that either erosion control measures should be implemented to control these losses or the materials should be placed back in the area of origin.

Response: The Corps concurs with the recommendation to use upland disposal. Unfortunately these sites are relatively scarce, privately owned, are reserved for solid waste disposal, or are marsh lands. As stated previously, the Corps secures the maximum benefits of dredged materials, provided no extra cost is incurred. See Federal Regulatory Commission Response #2(5) concerning erosion control.

4. Comment: We suggest that either paragraph 2, page ii, or paragraph 1.08 be rewritten so that there is a uniform estimate of the materials to be removed.

Response: These figures have been updated to reflect the quantities calculated after the 1977 sounding survey.

5. Comment: In paragraph 1.20, page 6, it is stated that the unpolluted dredge materials will be placed in the open-water disposal site or into the future disposal facility. Although the idea of disposal of materials into the confined disposal facility appears to be an ecologically sound alternative, it is eliminated from consideration on page 44, paragraph 6.13, as being uneconomical.

Response: This was an incorrect statement and has been corrected in the final statement.

6. Comment: In paragraph 6.15, page 45, under the heading "upland disposal," it is stated that access to disposal pump-out facilities for inland sites would require a new channel and turn around area. Depending on the type of dredge employed, materials could be off-loaded from barges directly into trucks and trucked to upland sites, thereby eliminating the need to build a new turn around area.

Response: True, although this entire procedure would be more costly than the proposed open-lake disposal. The Corps cannot justify the costs for the additional handling. To date, an upland site has not been made available.

7. Comment: On page 50, paragraph 8.05, it is stated that discharge of the dredge materials into the open-water disposal site would cause a permanent loss of this material from the shoreline from which much of it was eroded. Placement of the materials on upland sites would appear to be the environmentally correct solution.

Response: Disposal of the clean dredged material on upland sites might be more environmentally sound. The economics of the proposed operations still outweighs upland disposal.

U. S. DEPARTMENT OF TRANSPORTATION.

1. Comment: The draft environmental statement for the maintenance operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan, has been reviewed. As indicated in paragraph 4.36 of the statement, we agree the proposed action should not affect Federal-aid highways or highway structures. We have no other comments to offer on the statement.

Response: Noted.

U.S. ENVIRONMENTAL PROTECTION AGENCY

1. Comment: We have completed our review of the Draft Environmental Impact Statement (EIS) for Maintenance and Operation of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan. Based on information presented in the Draft EIS, we have no major

environmental objections to the proposed dredging, but request additional information for a complete assessment. We offer the following comments for your use in preparing a Final EIS.

Response: Noted.

2. Comment: It was indicated (page 6) in the EIS that unpolluted dredge spoil may be deposited into the future confined disposal facility. We recommend that alternate, beneficial uses of clean spoil be thoroughly investigated, and any extra space in the Bolles Harbor confined disposal facility be considered for containment of polluted material from either Bolles Harbor or neighboring harbors.

Response: This statement was in error and has been removed from the final environmental statement. The disposal alternatives section has been expanded to address beach nourishment and marsh creation. The extra space could be filled by material coming from the proposed Michigan DNR marina at Bolles Harbor.

3. Comment: The City of Monroe's water intake is located approximately six miles north of the navigation channel. Considering that predominant spring winds are from the south, the city intake facilities should be notified before dredging operations are begun and remedial measures developed in case excess turbidity levels occur.

Response: The City of Monroe would be notified of the proposed dredging operations. Should turbidity problems develop at the public water intake, dredging activities would be altered to prevent further problems. This problem is not anticipated since the water intake is about 6 miles away and upstream of the normal flow pattern.

4. Comment: The City of Monroe presently is conducting facilities planning under a Step 1 construction grant. The planning area includes Bolles Harbor; however, it appears that the statement on page 8 that the community will join the City of Monroe's wastewater treatment facilities in the near future is premature, pending completion of the Step 1 planning for the area.

Response: The reference to "the near future" has been removed.

5. Comment: On page 20, the statement "no endangered plant species are known to occur in the project area" conflicts with the assertion by the Lake Erie Advisory Committee that the proposed dredging and disposal activity will affect traditional habitat of the American Lotus, an endangered plant species. The Corps of Engineers should fully address this assertion and resolve any conflicts which may exist.

Response: The American lotus (Nelumbo lutea) was included in the listing of "Michigan's Endangered and Threatened Species program." Although it is listed for the shoreline of Lake Erie marshes, the project

for dredging and disposal does not infringe upon any marsh areas. Therefore, there are no anticipated impacts upon the American lotus from the proposed maintenance operations.

6. Comment: The statement on page 31 regarding the possibility of botulism occurring at the proposed disposal site should be expanded to cover the effectiveness of the suggested remedy and any other anticipated side effects flushing of the site may have on local water quality.

Response: This situation has occurred only a few times at other disposal sites and was minor in scope. No adverse impacts are anticipated from flushing the site. This procedure has been successfully accomplished at other disposal sites. The flushed water would be returned to the water via the weir. The effluent would be monitored to determine the effects of this activity.

7. Comment: As indicated in our May 15, 1977, letter to you, our Agency has been contacted by citizens in the Bolles Harbor area who are concerned about operation and maintenance impacts on the Plum Creek Bay Wildlife area. Potential impacts that may affect migratory bird population and fishing resources in the area should be specifically addressed. Since fish spawning and production activities in the area are quite high, the U.S. Fish and Wildlife Service and Michigan Department of Natural Resources should be contacted to determine environmentally sensitive periods, during which dredging activities should be avoided.

Response: According to the Michigan DNR survey, the maintenance dredging project lies outside of the former wildlife area. The migratory birds would be more likely to utilize the marshlands located south of Bolles Harbor, the 1,800 acre Erie State Game Area and the 2,900 acre Pointe Mouillee State Game Area. Perch, white bass, channel catfish and carp migrate in the spring, prior to the proposed operations. Communication with the Michigan DNR approves our dredging schedule and verifies the migration information.

8. Comment: As indicated in the above discussion and in accordance with EPA's procedures, we have classified our comments on the proposed dredging as LO lack of objection, and rated the Draft EIS as Category 2, additional information required. The date and classification of our comments will be published in the Federal Register.

Response: Noted.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES.

1. Comment: In general, we have no disagreement with your proposal to maintain the boating channel for the harbor in LaPlaisance Creek and Bay. In fact we favor the proposed projects since it will permit boaters and sportfishermen better access to Lake Erie. However, we do have several environmental concerns that should be addressed.

Response: Noted.

2. Comments: During the dredging operation, the wetlands on the north side of the creek should not be disturbed or modified. Secondly, in your statement you comment that good to excellent fishing is available in the harbor area. To assure that this fishing continues, the Corps should time their dredging so that it will not interfere with the early spring yellow perch and walleye spawning in the LaPlaisance Creek area. Dredging operations should be scheduled for other times during the year.

Response: The wetlands on the north side of the creek will not be altered or disturbed. They will, however, be altered by the marina the Michigan DNR plans to construct. Dredging is scheduled for June, July, and August, which doesn't interfere with the spawning or migration periods.

3. Comment: The only other general comment which we have on your statement is our continuing concern with the Corps' position that beneficial use of dredge spoils is not their concern. It remains our position that such materials should be treated as a resource and not wasted in offshore disposal areas. For this reason, I would encourage any use of these materials which could be determined as being beneficial and would not cause environmental destruction.

Response: As previously stated it is a Corps policy to secure the maximum practicable benefits through the utilization of materials dredged from authorized navigation channels and harbors, provided extra cost to the Government is not incurred. There are limitations on expenditures for handling the disposal of unpolluted materials. Should the DNR or other organization be able to offer land disposal sites or make available more beneficial alternatives at no cost to the Government, such alternatives would be undertaken.

4. Comment: I appreciate your agency's position that you welcome recommendations for uses of these materials by various reviewing agencies as alternatives to open water dumping. I feel, however, that it should be your agency's responsibility to actively seek out uses for these materials such as for road building, dike building and cover for landfills, etc., and present and review them as alternatives before a decision is made to dump these materials in open water areas.

Response: Other alternatives such as beach nourishment and marsh creation have been considered. As stated in Comment #3, maximum benefits must be secured with additional cost to the Government eliminated. The anticipated impacts do not appear to justify substantial cost increases.

5. Comment: Following are general comments which we have in the report. The report states (page 20) that the Corps conducted a biological survey of the Raisin River one mile north of Bolles Harbor to determine if any endangered species were living in the area. I suggest that if the Corps is checking for mussels that are on the endangered species list from the LaPlaisance Creek area that they conduct their biological survey in that area and not one mile north. The statement at the end of paragraph 2.5 on page 20 that says no rare or endangered species were found during the survey is fine if they were dredging the River Raisin.

Response: The bottom materials in Bolles Harbor and the River Raisin are similar in composition and would support similar species of mollusks. With the generally degraded condition that has existed within the harbor the last few years, it is very unlikely that delicate mollusks would select such sediments for their habitats.

6. Comment: Item 2.39, page 18. Survey data by investigating agencies now show the walleye population in western Lake Erie to be increasing. Also, yellow perch in the lake, while declining in average size, may or may not be declining in total numbers. In the same paragraph, the term "infrequently" is incorrectly used to depict commercial fishing in Michigan waters of Lake Erie. It would be correct to state that the level of commercial fishing has declined during the past five to seven years, as the result of changing fish populations and environmental contamination of commercially utilized fish species.

Response: The information on populations has been corrected. The statement on commercial fishing has been altered.

7. Comment: Item 2.40, page 18. Larval distribution differences have been noted of a variety of species--not just smelt and perch.

Response: This information has been added to the statement.

8. Comment: Item 2.41, page 19. Reptiles and amphibians are important wetland dwellers and should be listed by species if affected by the dredging. Table 7, however, does not list any as stated in this paragraph.

Response: A variety of reptiles and amphibians have been known to visit the surrounding wetland areas but should not be affected by the dredging operations. Table 7 has been omitted from the final statement.

9. Comment: Finally, Item 4.17, page 28. It is stated that the net loss to the aquatic food chain represents only a small fraction. We doubt that this statement can be substantiated on a quantified basis. It is suggested that it be reworded to the effect that the loss will be small and may or may not be important to the food chain production of the immediate area.

Response: Your suggestion is appreciated, and the statement has been reworded.

MICHIGAN UNITED CONSERVATION CLUBS.

1. Comment: The Michigan United Conservation Clubs appreciates this opportunity to comment on the above referenced draft environmental statement (DES) regarding Bolles Harbor. We have previously responded to the Public Notice of March 15, 1977 regarding the maintenance dredging and will refer below to our April 12, 1977 letter to the Detroit District.

Response: Noted.

2. Comment: Page 53 of the DES summarizes our comments: (1) we object to the method of disposal; (2) we would like to see a concurrent proposal for long-term wildlife management; (3) we would like to see the clean dredged materials utilized in a positive manner; (4) we questioned the status of the Plum Creek Bay Wildlife Area; and (5) we suggested that this project should provide impetus for starting a comprehensive resource management program for the site.

Response: Noted.

3. Comment: Only Item 4 was adequately addressed in the DES.

Response: The alternatives to the proposed methods of disposal were expanded and addressed in Section 6. When the disposal site is completed and turned over to local authorities, they would determine the long-term plans, as the Corps would not have the responsibility for development after completion. Marsh creation has been added as an alternative for the clean material disposal. A comprehensive resource management program would have to be initiated by the developers of the disposal site.

4. Comment: Items 1 and 3 can be considered together. Section 6 of the DES, "Alternatives to the Proposed Action," does not discuss

the possibility or the feasibility of utilizing clean dredged materials for marsh restoration or any other projects which could enhance the environment.

Response: Marsh creation was added to the alternative section in the final statement.

5. Comment: Items 2 and 5 can be considered together. Section 4.44 of the DES, "Remedial and Mitigative Measures," discusses no mitigative measures, only measures to minimize adverse impacts. There is no mention of the possibility of utilizing monies from Section 150 of the Water Resources Development Act of 1976 to mitigate and enhance the environmental aspects of this project.

Response: Marsh creation is being pursued for the Bolles Harbor project by the Corps, but coordination with the U.S. Fish and Wildlife Service has been unsuccessful to date. This alternative may be undertaken in the future.

6. Comment: At the October 6, 1977 meeting of the Winter Navigation Board in Cleveland, Brigadier General Robert L. Moore emphasized the need for a "feedback loop" concerning public comment on Corps activities. The lack of feedback on our specific questions to the Public Notice, questions phrased in anticipation of the DES, is a disappointment. One step in the public review process has apparently been wasted. We trust the final environmental statement will adequately address the public comments you have and will receive.

Response: We have attempted to prepare a thorough, but concise, environmental statement and hope we have adequately addressed the comments received in response to the draft environmental statement.

7. Comment: We have one additional comment, not directly germane to the DES under discussion. It concerns the configuration of the confined disposal facility (CDF); we recognize this was the subject of a final environmental statement of April, 1975. A workshop was held in Detroit on April 26, 1977 concerning the final report of the International Working Group on the Abatement and Control of Pollution from Dredging Activities (May, 1975), chaired by Mr. Carl C. Cable of the North Central Division of the Corps. One of the criticisms voiced regarding confined disposal facilities in the Great Lakes is their strict geometric configurations (e.g., the Bolles Harbor CDF), as opposed to configurations more compatible with natural geologic and environmental conditions (such as the Pointe Mouillee CDF or the proposed Plan 1 CDF at Plum Creek Bay). This was referred to in the Working Group report merely as problems of "aesthetic aspects." We trust that in the future, the Detroit District will be more sensitive to these aesthetic considerations in the engineering designs of confined disposal facilities.

Response: Noted.

SOUTHEAST MICHIGAN COUNCIL ON GOVERNMENTS.

1. Comment: As the certified A-95 Clearinghouse for Southeast Michigan, SEMCOG has received and reviewed the above cited Draft Environmental Impact Statement. In accordance with standard A-95 procedures, the following agencies have been contacted requesting their comments:

Michigan Department of Civil Rights
Monroe County Planning Commission
Monroe Township

Response: Noted.

2. Comment: To date, comments have been received from the Monroe County Planning Commission (attached). They recommend approval with one reservation. Their reservation is over the disposal of clear unpolluted dredge materials. The Planning Commission feels that this clean dredge material could be used for marsh restoration and should not be wasted by dumping it into the lake.

Response: This alternative has been addressed in the final statement in paragraph 6.20. We hope to use this alternative at some future date, subject to successful coordination with the Michigan DNR and the U.S. Fish and Wildlife Service.

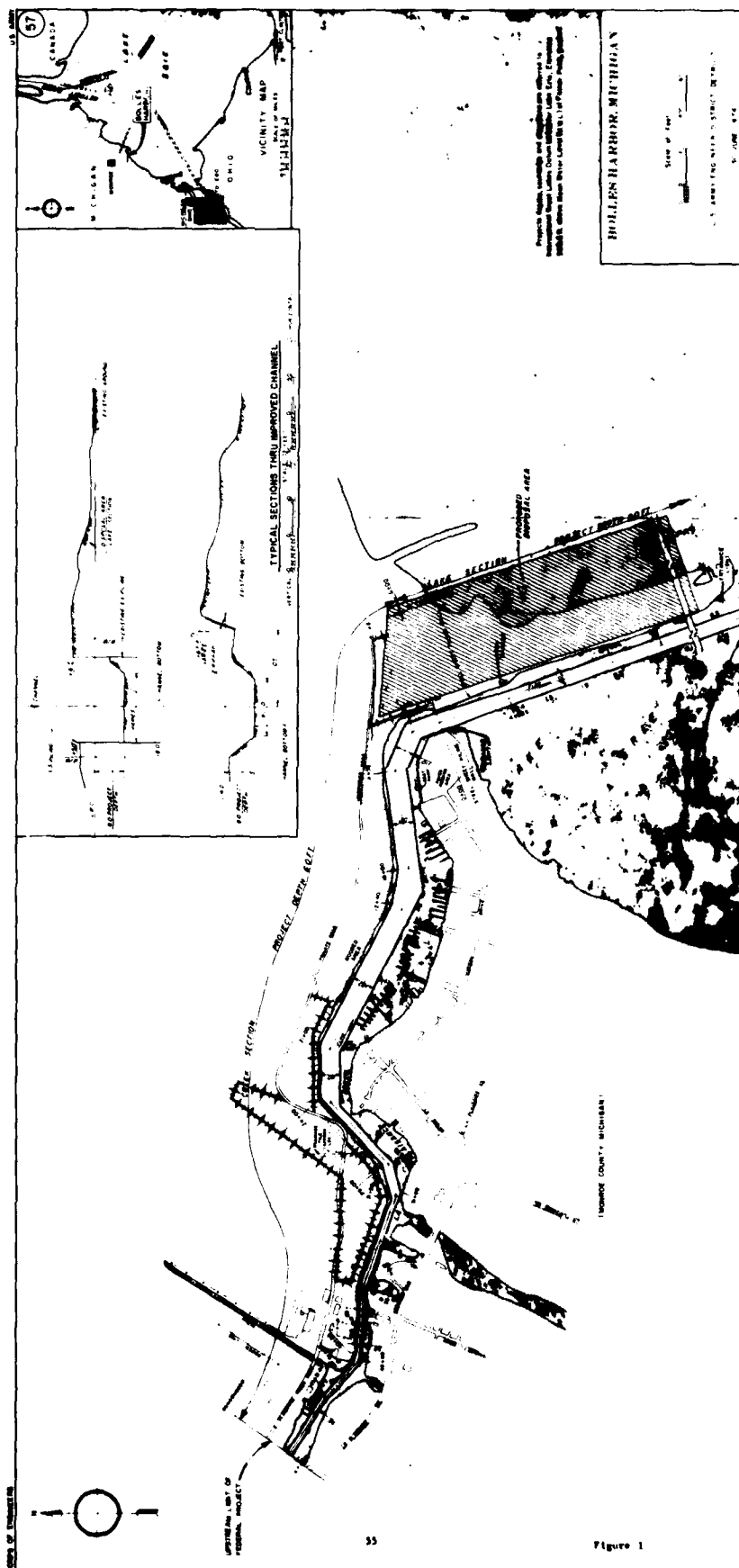
3. Comment: Our only comment concerns the geographical location of Bolles Harbor. The maps utilized in this report do not delineate minor civil division boundaries. Bolles Harbor is centrally located along the Lake Erie shoreline at Monroe Township. The text under Section 208 of page 10 implies that LaSalle and "South Monroe" are Townships which border Bolles Harbor. This is incorrect since Bolles Harbor is encompassed completely by Monroe Township and "South Monroe" is not a Township.

Response: The maps are project maps developed by the Corps to show their projects. They are not intended to delineate townships or other boundaries. South Monroe is a closely settled population center without corporate limits. This paragraph has been changed to indicate this information.

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8. Evenson, D. E. and C. X. Hopkins, Jr., 1973, Waterfowl at Houghton Lake, MDNR, T B 73-3.
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14. U. S. Department of Interior, FWPCA, 1968, 1968 Dredging Study, Detroit Program Office, DPO 31-A.

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16. U. S. Army Engineer Division, Fishery Handbook of Engineering Requirements and Biological Criteria, North Pacific Corps of Engineers, Portland, Oregon, 1973.
17. MDNR, September 1975, 1974 Michigan Recreational Boating Study, Report No. 4.



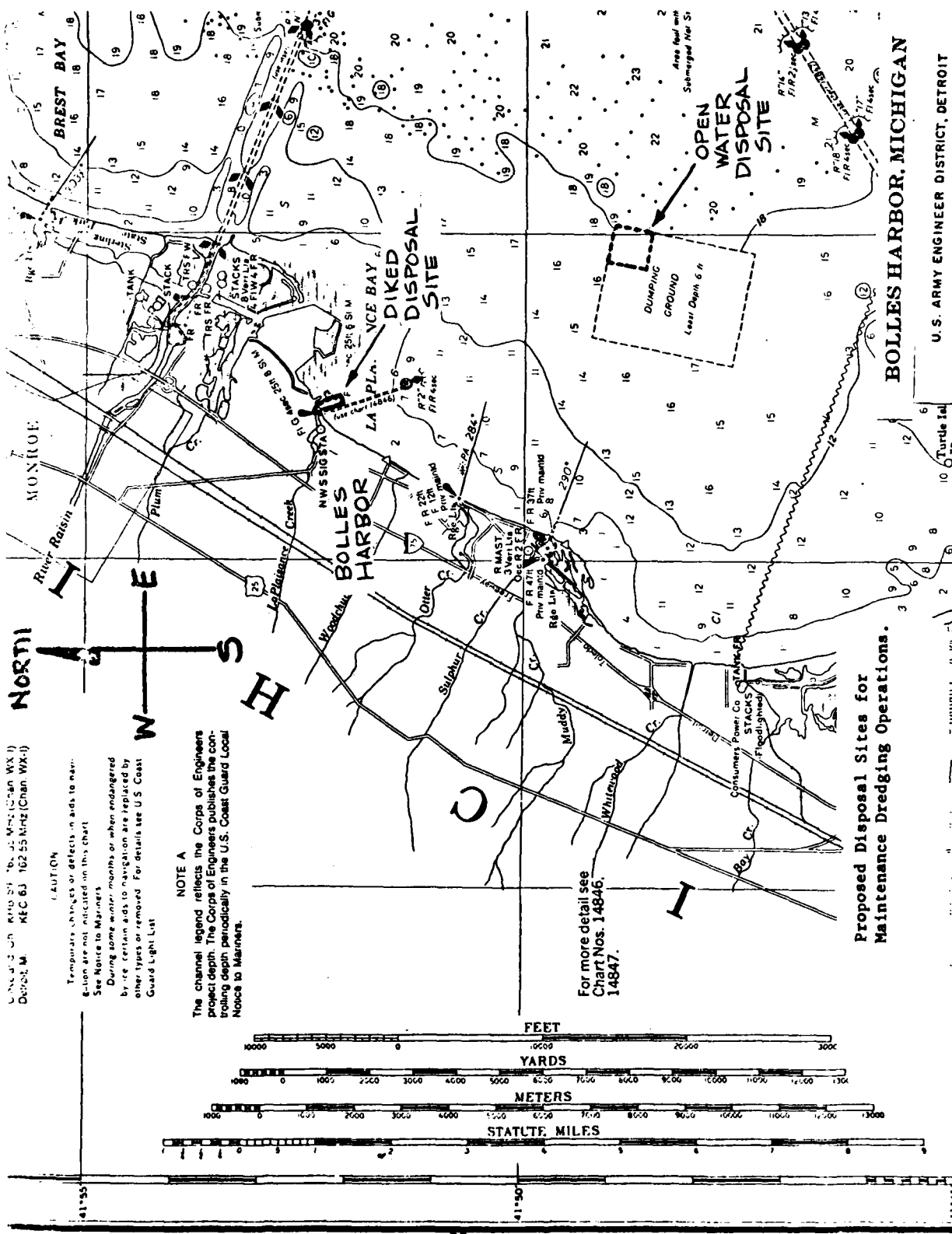
UNCLASSIFIED REF ID: A63555 (Chn WX-1)
 DETROIT M. REC 6J 162 55 Mhz (Chn WX-1)

CAUTION

Temperatures, changes or defects in aids to navigation are not indicated in this chart.
 See Notice to Mariners.
 During some winter months or when endangered by ice, certain aids to navigation are replaced by other types or removed. For details see U.S. Coast Guard Light List.

NOTE A

The channel legend reflects the Corps of Engineers project depth. The Corps of Engineers publishes the controlling depth periodically in the U.S. Coast Guard Local Notice to Mariners.



Advisory Council on
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

December 8, 1977

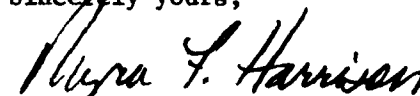
Ms. Judy McLain
U.S. Army Corps of Engineers
Environmental Resources Branch
Detroit District
P.O. Box 1027
Detroit, Michigan 48231

Dear Ms. McLain:

Thank you for your request of September 30, 1977, for comments on the environmental statement for Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan. Pursuant to Section 102 (2) (C) of the National Environmental Policy Act of 1969 and the Council's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800), we have determined that your draft environmental statement appears adequate concerning our area of interest, and we have no further comments.

Thank you for this opportunity to comment on this undertaking.

Sincerely yours,



Myra F. Harrison
Acting Director
Office of Review and
Compliance

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D. C. 20426

November 2, 1977

Mr. P. McCallister
Chief, Engineering Division
Detroit District, Corps of Engineers
Box 1027
Detroit, Michigan 48231

Dear Mr. McCallister:

I am replying to your request of September 30, 1977 to the Federal Energy Regulatory Commission for comments on the Draft Environmental Impact Statement for the Dredging and Maintenance, Bolles Harbors, Michigan. This Draft EIS has been reviewed by appropriate FERC staff components upon whose evaluation this response is based.

The staff concentrates its review of other agencies' environmental impact statements basically on those areas of the electric power and natural gas industries for which the Commission has jurisdiction by law, or where staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in these areas of concern nor serious conflicts with this agency's responsibilities should this action be undertaken.

Our review, however, has focused attention on the following.

- 1) The statement does not provide sufficient cost data to determine whether additional Federal expenditures are justified and to what extent.
- 2) Page 1, Section 1.03 - States that part of the original project justification was for a "Harbor of Refuge." Yet, 10 years later, it still remains to be designated as such.
- 3) Page 10, Section 2.09 - Since 2/3 of the harbor usage is by boats under 20 feet in length, how many of the remaining vessels are of the deep draft type? Has the relocation of these recreation vessels at a nearby deepwater harbor been considered as an alternative?

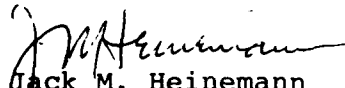
- 2 -

4) Unpolluted dredged sediments should be utilized in useful landfills, not in deep water disposal.

5) Sediment control at sources should be considered over repeated harbor dredgings.

Thank you for the opportunity to review this statement.

Sincerely,



Jack M. Heinemann
Advisor on Environmental Quality

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
NORTHEASTERN AREA, STATE AND PRIVATE FORESTRY
6816 MARKET STREET, UPPER DARBY, PA. 19082
(215) 596-1671

8430
November 14, 1977



Mr. P. McCallister
U.S. Army Engineer District, Detroit
ATTN: Chief, Environmental Resources Branch
P.O. Box 1027
Detroit, Michigan 48231


Refer to: NCEED-ER, Draft
Environmental Statement,
Maintenance Operations,
Bolles Harbor, MI

Dear Mr. McCallister:

Since dredged material will be deposited in open water,
we anticipate no significant impact on forested land
from this project.

Thank you for the opportunity to review this draft
statement.

Sincerely,


DALE O. VANDENBURG
Staff Director
Environmental Quality Evaluation

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE Room 101, 1405 South Harrison Road
East Lansing, Michigan 48823

October 28, 1977

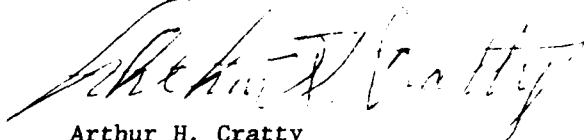
U.S. Army Engineer District, Detroit
ATTN: Chief, Environmental Resources Branch
P.O. Box 1027
Detroit, Michigan 48231

Gentlemen:

We have reviewed the Draft Environmental Statement for Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan, and do not have any comments.

We appreciate the opportunity to review and comment on this proposed project.

Sincerely,



Arthur H. Cratty
State Conservationist

cc: R. M. Davis, Administrator, SCS, Washington, D.C.
Coordinator, USDA, Env. Quality Activities, Washington, D.C.





UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230
(202) 377-3111

November 7, 1977

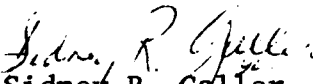
U.S. Army Engineer District, Detroit
ATTN: Chief, Environmental Resources Branch
Department of the Army
P.O. Box 1027
Detroit, Michigan 48231

Gentlemen:

This is in reference to your draft environmental impact statement entitled, "Maintenance Operations of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan." The enclosed comments from the National Oceanic and Atmospheric Administration are forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving eight (8) copies of the final statement.

Sincerely,


Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosure - Memo from Great Lakes Environmental Research
Laboratory, October 25, 1977



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Rockville, Maryland 20852

Great Lakes Environmental Research Lab.
2300 Washtenaw Avenue
Ann Arbor, MI 48104

October 25, 1977

To: Director, Office of Ecology
and Environmental Conservation

From: Eugene J. Aubert *E.J. Aubert*
Director, GLERL

Subj: DEIS 7709.46 - Maintenance Operations of the Federal
Navigation Channels and Structures at Bolles Harbor, MI

The subject DEIS prepared by the Corps of Engineers, Detroit District, on maintenance dredging of Bolles Harbor, Lake Erie, has been reviewed and comments are herewith submitted.

The proposed maintenance dredging in Bolles Harbor and disposal of clean spoil in Lake Erie will have, in our opinion, only insignificant permanent effects on water quality of Lake Erie.

Discussion of alternatives for clean spoil disposal appears to be insufficient. Statement rejects the use of marsh areas for sediment disposal as ecologically unwise (par. 6.14); however, it does not consider an alternative of creating or restoring a barrier beach for protection of marshlands.





United States Department of the Interior

OFFICE OF THE SECRETARY
NORTH CENTRAL REGION
2510 DEMPSTER STREET
DES PLAINES, ILLINOIS 60016

ER 77/910
xER 74/959

November 14, 1977

U.S. Army Engineer District, Detroit
ATTN: Chief, Environmental Resources Branch
P.O. Box 1027
Detroit, Michigan 48231

Dear Sir:

The U.S. Department of the Interior has reviewed the draft environmental statement (EIS) for Operation and Maintenance of the Federal Navigation Channel and Structures at Bolles Harbor, Monroe County, Michigan. We find the draft EIS is generally adequate in its assessment of the environmental impacts resulting from the project in all areas except the open-lake disposal of the unpolluted dredge materials.

We have stated in a response to your March 15, 1977 public notice (NCECO-0-33-B) for maintenance dredging on this project, that our policy generally recommends upland disposal methods as opposed to open-lake dumping. From the facts presented in the draft EIS it cannot be determined if disposal of approximately 80,000 cubic yards of unpolluted dredge material on approximately 160 acres of lake bottom will be beneficial to the aquatic environment. As outlined in the statement, most impacts of open-lake disposal would be of a negative character on any plants or benthic organisms at the site.

Studies conducted on the effects of open-lake dumping on certain parameters are forthcoming (January 1978) from a Corps of Engineers project conducted off Ashtabula, Ohio. Some effects of open-lake disposal on benthic organisms are known and have been documented, but many more questions concerning the effects open-lake dumping may have on the total ecosystem are unanswered. Until more information is gathered on the effects of open-lake dumping, we will continue to recommend upland disposal. Since the materials were swept from the land into the channel, it seems apparent to us that either erosion control measures should be implemented to control these losses or the materials should be placed back in the area of origin.

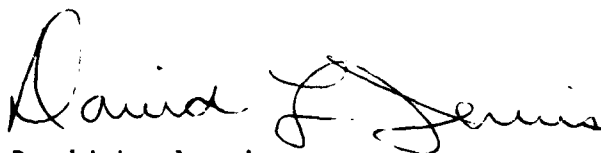
We suggest that either paragraph 2, page ii, or paragraph 1.08 be rewritten so that there is a uniform estimate of the materials to be removed.

In paragraph 1.20, page 6, it is stated that the unpolluted dredge materials will be placed in the open-water disposal site or into the future disposal facility. Although the idea of disposal of materials into the confined disposal facility appears to be an ecologically sound alternative, it is eliminated from consideration on page 44, paragraph 6.13, as being uneconomical.

In paragraph 6.15, page 45, under the heading "upland disposal", it is stated that access to disposal pump-out facilities for inland sites would require a new channel and turn around area. Depending on the type of dredge employed, materials could be off-loaded from barges directly into trucks and trucked to upland sites, thereby eliminating the need to build a new turn around area.

On page 50, paragraph 8.05, it is stated that discharge of the dredge materials into the open-water disposal site would cause a permanent loss of this material from the shoreline from which much of it was eroded. Placement of the materials on upland sites would appear to be the environmentally correct solution.

Sincerely yours,

A handwritten signature in cursive script, reading "David L. Jervis". The signature is written in dark ink and is positioned above the printed name and title.

David L. Jervis
Regional Environmental Officer



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION 5
18209 DIXIE HIGHWAY
HOMEWOOD, ILLINOIS 60430
October 12, 1977

IN REPLY REFER TO
HED-05

U.S. Army Engineer District Detroit
P.O. Box 1027
Detroit, Michigan 48231

Attention: Chief, Environmental Resources Branch

Gentlemen:

The draft environmental statement for the maintenance operations of the Federal navigation channels and structures at Bolles Harbor, Michigan has been reviewed. As indicated in paragraph 4.36 of the statement, we agree the proposed action should not affect Federal-aid highways or highway structures. We have no other comments to offer on the statement.

Sincerely yours,

Donald E. Trull
Regional Administrator

By:

W. G. Emrich, Director
Office of Environment and Design



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

REGION V
230 SOUTH DEARBORN ST
CHICAGO, ILLINOIS 60604

Mr. P. McCallister, Chief
Engineering Division
U.S. Army Corps of Engineers, Detroit
Box 1027
Detroit, Michigan 48231

Dear Mr. McCallister:

We have completed our review of the Draft Environmental Impact Statement (EIS) for Maintenance and Operation of the Federal Navigation Channels and Structures at Bolles Harbor, Michigan. Based on information presented in the Draft EIS, we have no major environmental objections to the proposed dredging, but request additional information for a complete assessment. We offer the following comments for your use in preparing a Final EIS.

It was indicated (page 6) in the EIS that unpolluted dredge spoil may be deposited into the future confined disposal facility. We recommend that alternate, beneficial uses of clean spoil be thoroughly investigated, and any extra space in the Bolles Harbor confined disposal facility be considered for containment of polluted material from either Bolles Harbor or neighboring harbors.

The City of Monroe's water intake is located approximately six miles north of the navigation channel. Considering that predominant spring winds are from the south, the city intake facilities should be notified before dredging operations are begun and remedial measures developed in case excess turbidity levels occur.

The City of Monroe presently is conducting facilities planning under a Step 1 construction grant. The planning area includes Bolles Harbor; however, it appears that the statement on page 8 that the community will join the City of Monroe's wastewater treatment facilities in the near future is premature, pending completion of the Step 1 planning for the area.

On page 20, the statement "no endangered plant species are known to occur in the project area" conflicts with the assertion by the Lake Erie Advisory Committee that the proposed dredging and disposal activity will affect traditional habitat of the American Lotus, an endangered plant species. The Corps of Engineers should fully address this assertion and resolve any conflicts which may exist.

The statement on page 31 regarding the possibility of botulism occurring at the proposed disposal site should be expanded to cover the effectiveness of the suggested remedy and any other anticipated side effects flushing of the site may have on local water quality.

As indicated in our May 15, 1977, letter to you, our Agency has been contacted by citizens in the Bolles Harbor area who are concerned about operation and maintenance impacts on the Plum Creek Bay Wildlife area. Potential impacts that may affect migratory bird population and fishing resources in the area should be specifically addressed. Since fish spawning and production activities in the area are quite high, the U.S. Fish and Wildlife Service and Michigan Department of Natural Resources should be contacted to determine environmentally sensitive periods, during which dredging activities should be avoided.

As indicated in the above discussion and in accordance with EPA's procedures, we have classified our comments on the proposed dredging as LO, lack of objection, and rated the Draft EIS as Category 2, additional information required. The date and classification of our comments will be published in the Federal Register.

Thank you for the opportunity to review the subject document. If you have any questions about our comments, please contact Ms. Barbara Taylor of my staff at 312/353-2307. Please send us two copies of the Final EIS when it is filed with the Council on Environmental Quality.

Sincerely,



Susan P. Walker, Chief
Environmental Impact Review Staff
Office of Federal Activities

NATURAL RESOURCES COMMISSION

CARL T. JOHNSON
E. M. LAITALA
DEAN PRIDGEON
MILARY F. SNELL
HARRY H. WHITELEY
JOAN L. WOLFE
CHARLES G. YOUNGLOVE



WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, BOX 30028, LANSING, MICHIGAN 48909
HOWARD A. TANNER, Director

December 21, 1977

Mr. P. McCallister
Corps of Engineers
Detroit District
P.O. Box 1027
Detroit, Michigan 48231

Dear Mr. McCallister:

Thank you for the opportunity to review the draft Environmental Statement for Maintenance Operations at Bolles Harbor, Michigan, dated September 1977.

In general, we have no disagreement with your proposal to maintain the boating channel for the harbor in LaPlaisance Creek and Bay. In fact we favor the proposed project since it will permit boaters and sportfishermen better access to Lake Erie. However, we do have several environmental concerns that should be addressed.

During the dredging operation, the wetlands on the north side of the creek should not be disturbed or modified. Secondly, in your statement you comment that good to excellent fishing is available in the harbor area. To assure that this fishing continues, the Corps should time their dredging so that it will not interfere with the early spring yellow perch and walleye spawning in the LaPlaisance Creek area. Dredging operations should be scheduled for other times during the year.

The only other general comment which we have on your statement is our continuing concern with the Corps' position that beneficial use of dredge spoils is not their concern. It remains our position that such materials should be treated as a resource and not be wasted in offshore disposal areas. For this reason, I would encourage any use of these materials which could be determined as being beneficial and would not cause environmental destruction.

I appreciate your agency's position that you welcome recommendations for uses of these materials by various reviewing agencies as alternatives to open water dumping. I feel, however, that it should be your agency's responsibility to actively seek out uses for these materials such as for road building, dike building and cover for landfills, etc., and present and review them as alternatives before a decision is made to dump these materials in open water areas.



R1026 10/76

December 21, 1977

Following are general comments which we have in the report. The report states (page 20) that the Corps conducted a biological survey of the Raisin River one mile north of Bolles Harbor to determine if any endangered species were living in the area. I suggest that if the Corps is checking for mussels that are on the endangered species list from the LaPlaisance Creek area that they conduct their biological survey in that area and not one mile north. The statement at the end of paragraph 2.5 on page 20 that says no rare or endangered species were found during the survey is fine if they were dredging the River Raisin.

Item 2.39, page 18. Survey data by investigating agencies now show the walleye population in western Lake Erie to be increasing. Also, yellow perch in the lake, while declining in average size, may or may not be declining in total numbers. In the same paragraph, the term "infrequently" is incorrectly used to depict commercial fishing in Michigan waters of Lake Erie. It would be correct to state that the level of commercial fishing has declined during the past five to seven years, as the result of changing fish populations and environmental contamination of commercially utilized fish species.

Item 2.40, page 18. Larval distribution differences have been noted of a variety of species--not just smelt and perch.

Item 2.41, page 19. Reptiles and amphibians are important wetland dwellers and should be listed by species if affected by the dredging. Table 7, however, does not list any as stated in this paragraph.

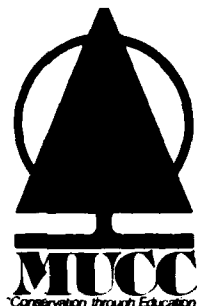
Finally, Item 4.17, page 28. It is stated that the net loss to the aquatic food chain represents only a small fraction. We doubt that this statement can be substantiated on a quantified basis. It is suggested that it be reworded to the effect that the loss will be small and may or may not be important to the food chain production of the immediate area.

If you have any questions regarding our comments, please contact my Department.

Sincerely,


Howard A. Tanner
Director

October 12, 1977



MICHIGAN UNITED CONSERVATION CLUBS
2101 Wood St. ● P.O. Box 30235 ● Lansing, MI 48909 ● 517-371-1041

U.S. Army Engineer District, Detroit
Environmental Resources Branch
P.O. Box 1027
Detroit, MI 48231

ATTENTION: Mr. A. J. Nicholson, Chief

Dear Mr. Nicholson:

RE: Draft Environmental Statement: Maintenance Operations
of the
Federal Navigation Channels and Structures at Bolles
Harbor, Michigan
September, 1977

The Michigan United Conservation Clubs appreciates this opportunity to comment on the above referenced draft environmental statement (DES) regarding Bolles Harbor. We have previously responded to the Public Notice of March 15, 1977 regarding the maintenance dredging and will refer below to our April 12, 1977 letter to the Detroit District.

Page 53 of the DES summarizes our comments: (1) we object to the method of disposal; (2) we would like to see a concurrent proposal for long-term wildlife management; (3) we would like to see the clean dredged materials utilized in a positive manner; (4) we questioned the status of the Plum Creek Bay Wildlife Area; and (5) we suggested that this project should provide impetus for starting a comprehensive resource management program for the site.

Only Item 4 was adequately addressed in the DES.

Items 1 and 3 can be considered together. Section 6 of the DES, "Alternatives to the Proposed Action," does not discuss the possibility or the feasibility of utilizing clean dredged materials for marsh restoration or any other projects which could enhance the environment.

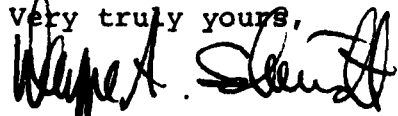
U.S. Army Engineer District
Page 2
October 12, 1977

Items 2 and 5 can be considered together. Section 4.44 of the DES, "Remedial and Mitigative Measures," discusses no mitigative measures, only measures to minimize adverse impacts. There is no mention of the possibility of utilizing monies from Section 150 of the Water Resources Development Act of 1976 to mitigate and enhance the environmental aspects of this project.

At the October 6, 1977 meeting of the Winter Navigation Board in Cleveland, Brigadier General Robert L. Moore emphasized the need for a "feedback loop" concerning public comment on Corps activities. The lack of feedback on our specific questions to the Public Notice, questions phrased in anticipation of the DES, is a disappointment. One step in the public review process has apparently been wasted. We trust the final environmental statement will adequately address the public comments you have and will receive.

We have one additional comment, not directly germane to the DES under discussion. It concerns the configuration of the confined disposal facility (CDF); we recognize this was the subject of a final environmental statement of April, 1975. A workshop was held in Detroit on April 26, 1977 concerning the final report of the International Working Group on the Abatement and Control of Pollution from Dredging Activities (May, 1975), chaired by Mr. Carl C. Cable of the North Central Division of the Corps. One of the criticisms voiced regarding confined disposal facilities in the Great Lakes is their strict geometric configurations (e.g., the Bolles Harbor CDF), as opposed to configurations more compatible with natural geologic and environmental conditions (such as the Pointe Mouillee CDF or the proposed Plan 1 CDF at Plum Creek Bay). This was referred to in the Working Group report merely as problems of "aesthetic aspects." We trust that in the future, the Detroit District will be more sensitive to these aesthetic considerations in the engineering designs of confined disposal facilities.

Very truly yours,



Wayne A. Schmidt
Staff Ecologist

WS: gm



Southeast Michigan Council of Governments
800 Book Building Detroit Michigan 48226 (313) 961-4266

November 15, 1977

Mr. P. McCallister
Chief, Engineering Division
U.S. Army Engineer District, Detroit
Environmental Resources Branch
P.O. Box 1027
Detroit, MI 48231

RE: Draft Environmental Impact Statement
Maintenance Operations of the Federal Navigation
Channels and Structures at Bolles Harbor, Michigan
Monroe County, State Planning Region I
Areawide Clearinghouse Code: EN 770731

Dear Mr. McCallister:

As the certified A-95 Clearinghouse for Southeast Michigan, SEMCOG has received and reviewed the above cited Draft Environmental Impact Statement. In accordance with standard A-95 procedures, the following agencies have been contacted requesting their comments:

Michigan Department of Civil Rights
Monroe County Planning Commission
Monroe Township

To date, comments have been received from the Monroe County Planning Commission (attached). They recommend approval with one reservation. Their reservation is over the disposal of clear unpolluted dredge materials. The Planning Commission feels that this clean dredge material could be used for marsh restoration and should not be wasted by dumping it into the lake.

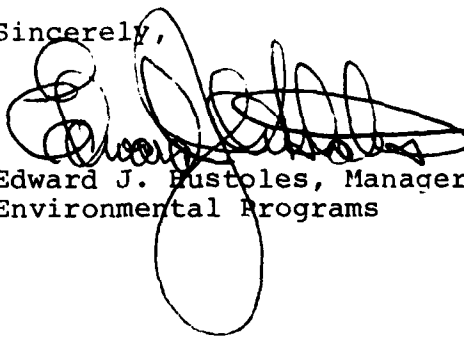
Other comments will be promptly forwarded to you as they are received.

Our only comment concerns the geographical location of Bolles Harbor. The maps utilized in this report do not delineate minor civil division boundaries. Bolles Harbor is centrally located along the Lake Erie shoreline at Monroe Township. The text under Section 208 of page 10 implies that LaSalle and "South Monroe" are Townships which border Bolles Harbor. This is incorrect since Bolles Harbor is encompassed completely by Monroe Township and "South Monroe" is not a Township.

P. McCallister
November 15, 1977
Page Two

In conclusion, we wish to thank the Army Corps of Engineers for the opportunity to comment on this draft report. It is our hope that these comments will be of help to the Corps when the Final Environmental Impact Statement is written.

Sincerely,



Edward J. Bustoles, Manager
Environmental Programs

EJH/CDH/lh
Attachment

cc: Monroe County Planning Commission



CH-1
**Monroe County Planning Department
and Commission**

1410 EAST FIRST STREET

MONROE, MICHIGAN 48161

Telephone: (313) 243-6900 Ext. 277

October 13, 1977

ROYCE R. MANIKO,
Planning Director

BERNARD J. FELDER,
Commission Chairman

Southeast Michigan Council
of Governments
1249 Washington Blvd.
Detroit, Michigan 48226

Attn.: Mr. Carl Harlow

Subject: Letter of Intent - OMB A-95-200.2-10-77-84
Maintenance Operations on the Federal Navi-
gation Channels and Structures at Bolles Harbor.

RECEIVED

OCT 16 1977

SOUTHEAST MICHIGAN
COUNCIL OF GOVERNMENTS

Dear Mr. Harlow:


We have completed our review of the above prefaced subject matter and advise as follows:

"Moved by Mr. Weiss and seconded by Mr. Chapman that the Monroe County Planning Commission approve with reservations that the clean or unpolluted dredge material should be utilized for marsh restoration and not dumped in the proposed open lake site for federal grant assistance by the Corps of Engineers from the Department of Defense for the purpose of maintenance operations on the Federal navigation channels and structures at Bolles Harbor, Monroe County, Michigan. Motion carried."

We further enclose a copy of staff memorandum in this regard to indicate the consideration which went into the resolution of this issue.

Thank you for allowing us this opportunity to respond to the subject matter as it affects areawide plans adopted by our Planning Commission.

Sincerely,


Royce R. Maniko, Director

October 3, 1977

MEMORANDUM

TO: Monroe County Planning Commission

FROM: Staff

SUBJECT: OMB A-95 Referral, Draft E.I.S. Maintenance Dredging
of Bolles Harbor - U.S. Army Corps of Engineers.
Areawide Clearinghouse Code: EN 770781

1. Description of Project

This project represents the Draft Environmental Impact Statement for maintenance dredging of the navigational channel at Bolles Harbor, and the subsequent disposal of these dredgings in part in open water with the remainder, that are polluted, to be placed in a confined disposal facility at the mouth of LaPlaisance Creek.

2. Planning Analysis

The maintenance dredging for LaPlaisance Creek is needed, as the movement of recreational boating may be impeded if not performed. At present there is a backlog of roughly 145,000 cubic yards of dredge material. Average dredging operations would call for about 36,000 cubic yards every 2 years for removal. Two sites have been proposed for this operation, they are: 1) an open water site 4 1/4 miles offshore for unpolluted materials and 2) a confined disposal site at the mouth of LaPlaisance Creek on the east side of the existing jetty.

Although State and Federal Agencies have responded favorably to this project, staff feels that the clean or unpolluted dredge material should be utilized for marsh restoration and not dumped in the proposed open lake site. This would be in conformance with the goals and objectives of the Monroe County Coastal Zone Management Program and the recently adopted plan for maintenance dredging of the River Raisin by the Port Area Development Committee.

Staff would also back the concerns of local conservation and ecology groups to preserve the trees on the north side of LaPlaisance Creek at its mouth from destruction in construction activities as they are one of the few remaining remnants of the former Lake Erie barrier beaches.

3. Recommendation

That the Monroe County Planning Commission endorse the Draft E.I.S. for maintenance dredging and accessory activities at Bolles Harbor, along with the recommendations as outlined by staff above, as the intent of the project is consistent with local plans.

ATE
LME